RADIANT®

Heating technology since 1959

Instruction Manual
for model

RK 100

Premix condensing system boiler

Installation, operating, commissioning and maintenance instructions.

CE 0694

RK 100 - RAD - ING - MAN.INST – 1311.1 - DIGITECH CS MIAH4

Technical Specification **RADIANT BRUCIATORI S.p.A.** Montelabbate (PU) ITALY

ENGLISH

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1. GENERAL INFORMATION

1.1 General warnings

⚠ **Professionally qualified personnel in accordance with current laws and standards and in line with the manufacturer's instructions must install the appliance.**

⚠ **With 'Professionally qualified personnel' is intended a personnel with technical knowledge in the field of installation and maintenance of components for central heating and domestic hot water production systems for domestic and industrial use.**

⚠ **The appliance must be used solely for the purpose for which it has been designed and manufactured: central heating and domestic hot water production. Any other use is deemed as improper and as such dangerous. Under no circumstances will the manufacturer be held responsible for damage or injury to persons or animals caused by errors in the installation and/or use of the appliance, or through non-compliance with current local and national standards and/or the manufacturer's instructions.**

⚠ **The installation, operation and maintenance manual forms an integral and essential part of the product and must be kept near the appliance always.**

⚠ **This manual must be kept in a safe place and made available for any future reference. If the appliance is sold or transferred to a different owner, this must follow the appliance to be red by the new owner and/or installer.**

⚠ **The warnings contained in this chapter have been written for the appliance user, the installer and the service engineer.**

⚠ **The user manual must be red carefully as it provides information on the operation and the operating limits of the appliance.**

⚠ **This appliance must be used exclusively in a pressurised central heating system.**

- After the removal of all the packaging, check that the appliance has not been damaged. In case of doubt, do not attempt to use the product but refer to the supplier. Packing materials (cardboard box, wooden crate, nails, staples, plastic bags, polystyrene, etc.) must not be left within reach of children in that these items represent a potential hazard and must be disposed of in a responsible manner.
- Before carrying out any cleaning or maintenance operations, disconnect the appliance from the mains electricity supply by switching off at the main switch and/or any other isolating device.
- Do not obstruct the air intake or flue exhaust grills.
- Do not obstruct the air intake or flue exhaust terminals.
- In the case of a fault and/or malfunction in the appliance, shut down the system. Do not interfere with or attempt any repairs. Call for professionally qualified technical assistance only.
- Any warranty repairs to the appliance must be carried out exclusively by the manufacturer's authorised service centre using original spare parts. Non-compliance with the above requirements may compromise the safety of the appliance and invalidate the warranty. In order to guarantee the efficiency of the appliance and its correct operation, it must be serviced regularly by professionally qualified personnel in line with the manufacturer's instructions.
- When the appliance is no longer required for use, any parts that may constitute potential sources of danger must be rendered harmless.
- Only original accessories or optional extras (including electrical parts) must be used with the appliance.
- Should there be a smell of gas present in the room where the appliance is installed, **DO NOT** attempt to activate any electric switches, telephones or any other equipment that may cause sparks. Open doors and windows immediately to create a current of air and ventilate the room. Shut-off the main gas supply valve (at the meter), or on the cylinder in the case of bottled gas, and call an authorised service centre.
- **Do not attempt to interfere with the appliance in any way.**
- As dictated by current legislation, this appliance **must be installed exclusively by qualified personnel.** Before starting the boiler for the first time, make sure that it is connected to a water supply and central heating system compatible with its performance characteristics.

- The room must be ventilated by means of an air intake positioned at floor level and protected with a grill. Make sure the grill does not reduce the passage section.
- The air inflow from adjacent rooms is allowed providing that those rooms are in depression with respect to the atmosphere and that **there are not fireplace or fan installed**. When the appliance is installed outdoor, i.e. on balcony or terrace, make sure it is not directly exposed to atmospheric agents to prevent any damage to components which would lead to a warranty invalidation. It is recommended to provide the boiler with a protective casing/box against bad whether conditions.
- **Check the technical data reported on the packing and on the rating plate** located on the inside of the front casing. Also check that the burner is appropriate for the type of gas to burn.
- **Make sure that the pipes and fittings used for the gas service are perfectly tight and that there are no gas leaks**.
- Prior to start-up, the central heating pipes should be flushed to remove any residues that could compromise the operation of the appliance.
- The appliance can be regarded as being electrically safe when it has been connected to an efficient earth system installed in accordance with the requirements of current safety standards. This fundamental safety requirement must be checked and verified. In case of doubt, have the electrical system checked by a qualified electrician. The manufacturer will not be held liable for any damage or injury caused as a result of an ineffective or non-existent earth system.
- The domestic power supply must be checked by a qualified electrician to ensure that it can support the maximum power absorption of the appliance, as indicated on the appliance data plate (positioned on the inside of the front casing). In particular, make sure that the cable ratings are adequate for the power absorbed.
- Do not use adapters; multiple sockets or extension leads to connect the appliance to the mains power supply.
- The appliance must be connected to the mains power supply through an appropriate electrical isolator in accordance with the current wiring regulations.
- When using an electrical appliance, a few fundamental rules must be observed:
- Do not touch the appliance with damp or wet parts of the body or when barefoot
- Do not pull on the electric wires
- Do not leave the appliance exposed to atmospheric elements (rain, sun, etc,) unless these conditions have been expressly provided for.
- Do not allow the appliance to be used by children or anyone unfamiliar with its operation.
- The user must not replace the power supply cable.
- If the cable is damaged in any way, switch off the appliance and have the cable replaced by a suitably qualified electrician.
- **When the appliance is no longer required for use, switch off the main power supply, to switch all electrical components off (circulating pump, burner etc.)**

1.2 Product conformity

RADIANT BRUCIATORI S.p.A. declares that all its products are manufactured to a high specification and in compliance with the relevant standards.

All **RADIANT** boilers are **CE** certified and possess technical and functional characteristics that comply with the following standards:

UNI EN 297 for GAS-FIRED CENTRAL HEATING BOILERS TYPE B OF NOMINAL HEAT INPUT ≤ 70 kW

EN 483 for GAS-FIRED CENTRAL HEATING BOILERS TYPE C OF NOMINAL HEAT INPUT ≤ 70 kW

UNI EN 677 for GAS-FIRED CENTRAL HEATING BOILERS. SPECIFIC REQUIREMENTS FOR CONDENSING BOILERS WITH NOMINAL HEAT INPUT ≤ 70 kW

Gas fired boilers also comply with the following directives:

GAS APPLIANCES DIRECTIVE 90/396 CEE for CE compliance

LOW VOLTAGE DIRECTIVE 2006/95 CEE

ELECTROMAGNETIC COMPATIBILITY DIRECTIVE 2004/108 CEE

BOILER EFFICIENCY DIRECTIVE 92/42 CEE

The materials used such as copper, brass, stainless steel, etc. form a compact, homogeneous, highly functional unit that is easy to install and simple to operate. In its simplicity, the wall-mounted appliance is equipped with all the appropriate accessories required to make it a fully independent boiler capable of satisfying domestic hot water production and central heating needs. All boilers are fully inspected and are accompanied by a quality certificate, signed by the inspector, and a guarantee certificate. This manual must be kept in a safe place and must **accompany the boiler at all times.**

RADIANT BRUCIATORI S.p.A. will not be held responsible for any misinterpretation of this manual resulting from the inaccurate translation of same.

RADIANT BRUCIATORI S.p.A. will not be held responsible for the consequences in the case of non-observance of the instructions contained in this manual or in the case where actions not specifically described herein are undertaken.

Radiant Bruciatori S.p.A. declare that no substances harmful to health are contained in the appliance or used during appliance manufacture and have not used or intend to use any of the following substances in the manufacture of Radiant heating products.

- **Asbestos**
- **Mercury**
- **CFC's.**

2. TECHNICAL CHARACTERISTICS

2.1 Technical data

Modell		**RK 100**
CE Certification	n°	0694CO7385
Appliance Category		I_{2ELL}
Appliance Type		B23p
Heat Input max	kW	100
Heat Input min	kW	25
Heat Output max (80/60°C)	kW	97
Heat Output max (50/30°C)	kW	106.3
Heat Output min. (80/60°C)	kW	24.53
Heat Output min. (50/30°C)	kW	27.2
Efficiency 100% (full load) (80/60°C)	%	97
Efficiency 100% (full load) (50/30°C)	%	106,3
Efficiency 30% (partial load) (80/60°C)	%	101.8
Efficiency 30% (partial load) (50/30°C)	%	108.5
Efficiency at Heat Output min - 60/80°C	%	98.1
Efficiency at Heat Output min - 50/30°C	%	108.8
GAS DIRECTIVE 92/42/ECC - Efficiency marking	Stars	4
NOx	Class	V
Central heating Circuit		
Central Heating water temperature setting (min-max)	°C	30-80 / 25-45
Max. Heating working temperature	°C	95
Max. working pressure	bar	5
Water content	litres	7.6
Dimension (Boiler casing size)		
Width	mm	495
Height	mm	800
Depth	mm	570
Weight (net)	kg	87
Hydraulic connections		
Central heating flow	Ø	1”1/2
Central heating return	Ø	1”1/2
Gas connection	Ø	3/4”
Flue Systems		
Horizontal single pipe flue system	Ø mm	100
Max. horizontal flue length	m	20 (168 Hz)[1] – 40 (180 Hz)[2]
Vertical single pipe flue system	Ø mm	100
Max. vertical flue length	m	15 (168 Hz)[1] – 30 (180 Hz)[2]
Fan available Pressure Δp (100% full load)	Pa	146
Fan available pressure Δp (Part Load)	Pa	30

(1) Fan frequency – standard value (see “3.9.3 Flue kit systems“ and “5.3 Setting the parameters“)
(2) Fan frequency - enhanced value (see “3.9.3 Flue kit systems“ and “5.3 Setting the parameters“)

Gas Supply		
Natural Gas G20		
Nominal inlet pressure	mbar	20
Nominal inlet pressure – max	mbar	23
Nominal inlet pressure – min	mbar	15
Gas consumption	m^3/h	10.42
Electrical specifications		
Power supply	V/Hz	230/50
Electrical power consumption	W	430
Pump electrical power consumption	W	240
Electrical power consumption – boiler OFF	W	5.4
Electrical protection	IP	X4D
Combustion Data		
Combustion Efficiency – (100% full load)	%	97.6
Combustion Efficiency – (minimum load)	%	98.2
Flue efficiency losses with burner ON (100% full load)	%	2.4
Flue Efficiency losses with burner ON (minimum load)	%	1.8
Casing Efficiency losses (100% full load)	%	0.1
Casing Efficiency losses (minimum load)	%	1
Flue Efficiency losses with burner OFF	%	0.02
Casing Efficiency losses with burner OFF	%	0.03
Flue gas temperature – Heat Input max	°C	74.6
Flue gas temperature – Heat Input min	°C	61.2
Flue Mass at Heat Input max (80/60°C)	kg/h	159.6
Flue Mass at Heat Input min (80/60°C)	kg/h	40
CO_2 value at Heat Input max	%	9.4
CO_2 value at Heat Input min	%	9.2
CO value at Heat Input max (0% O_2) Weighted	ppm	10
CO value at Heat Input min (0% O_2)	ppm	5
NOx	ppm	13
NOx	mg/kWh	23
NOx Emissions (UNI EN 297)	Class	5

2.2 Dimensions

2.2.1 Single unit

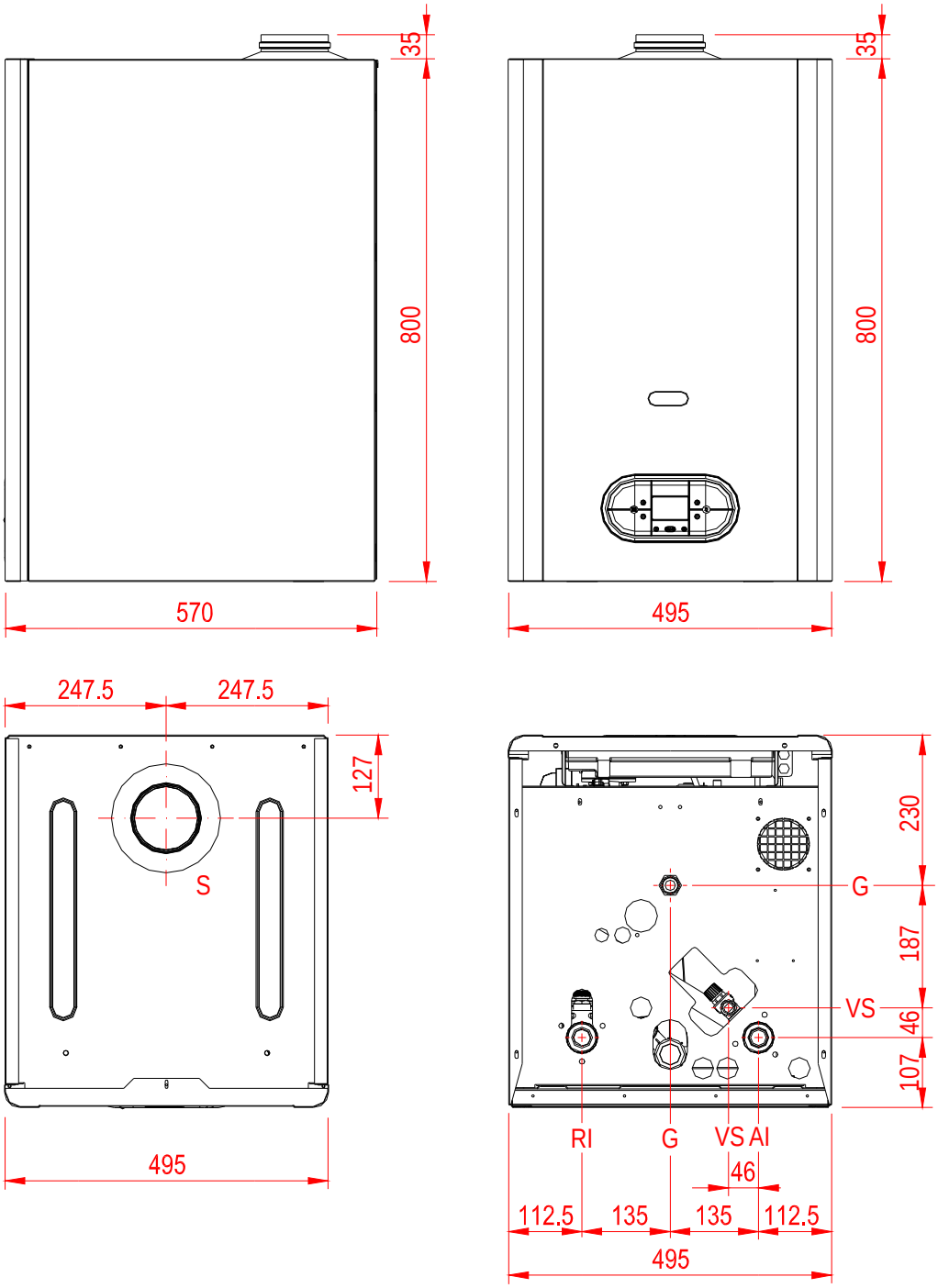


Fig. 1

KEY

RI	HEATING RETURN	Ø1”1/2
AI	HEATING FLOW	Ø1”1/2
G	GAS	Ø3/4”
SC	CONDENSATE DRAIN	Ø25
VS	SAFETY VALVE DISCHARGE	Ø1/2”
S	FLUE OUTLET	Ø100

2.2.2 Boiler + frame - Individual installation

The individual boiler installation, is possible in: only-heating version (R version) or connected to a remote storage cylinder for the domestic hot water production (RS version).

mod. R **mod. RS**

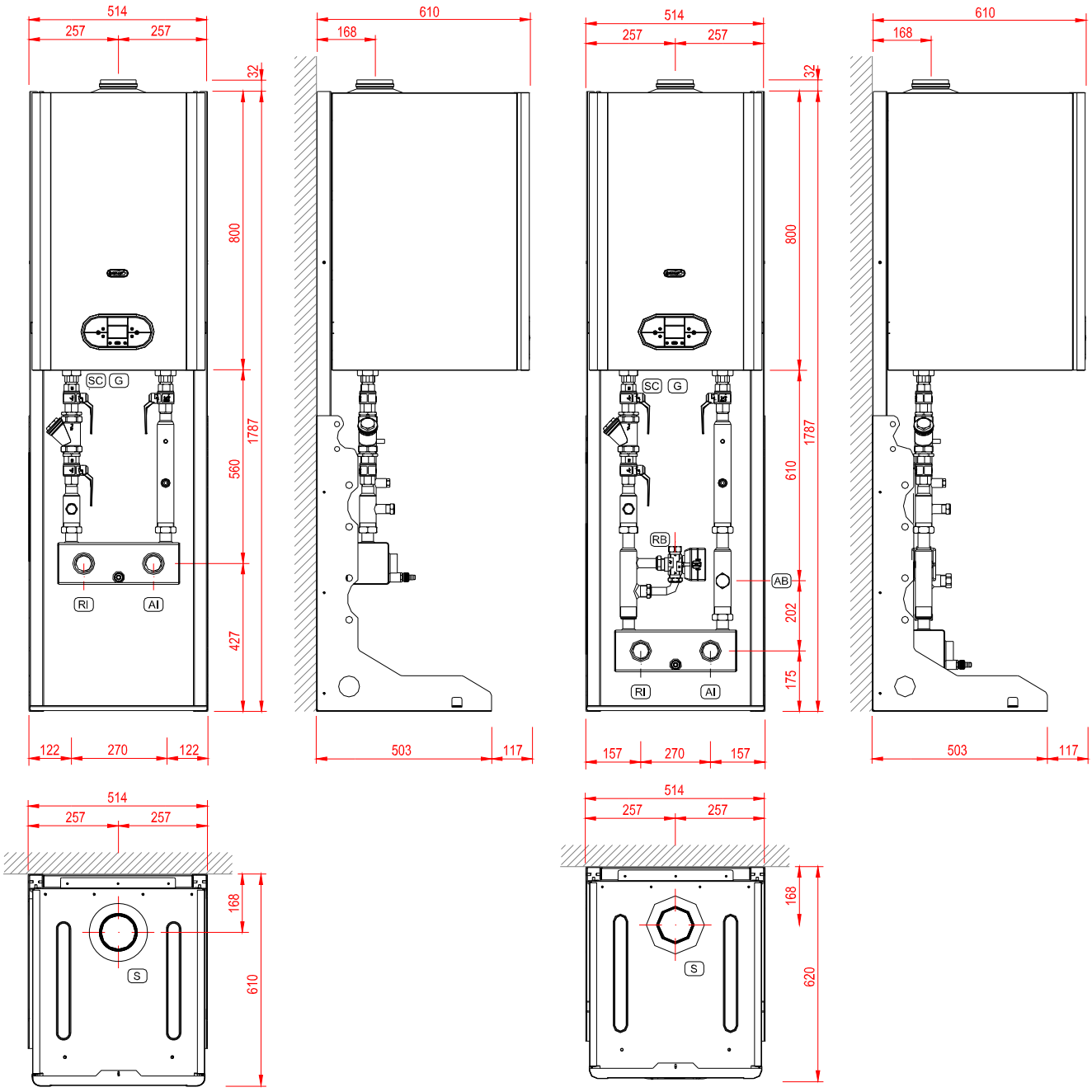
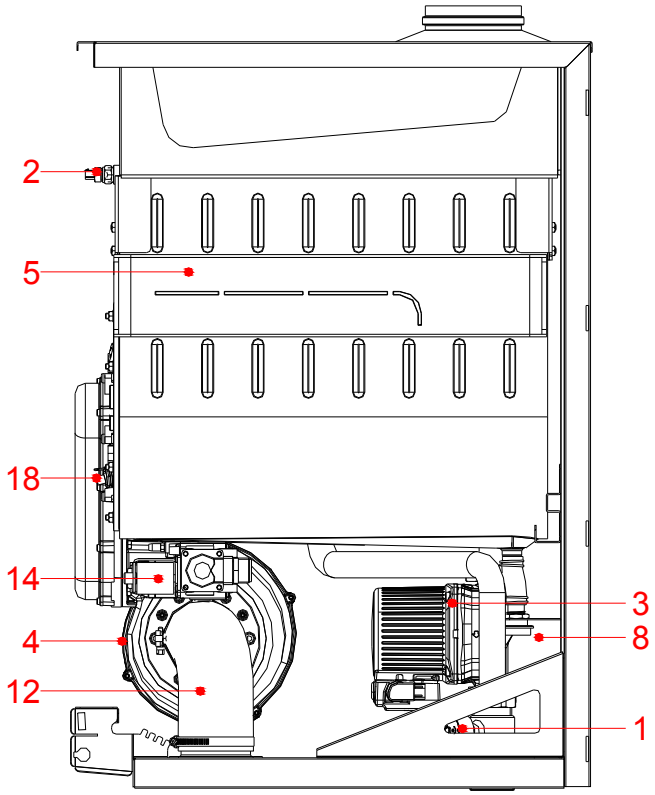


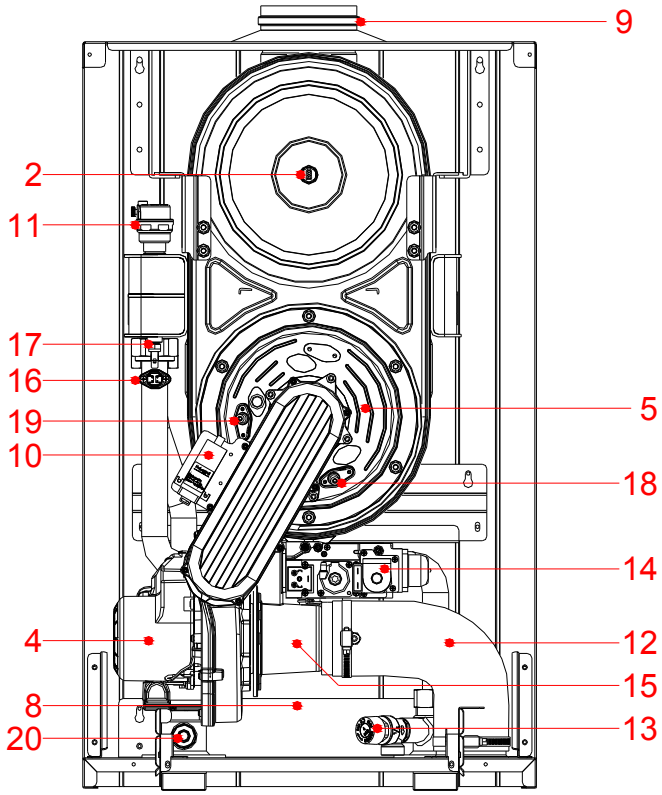
Fig. 1

LEGEND		
AI	HEATING FLOW	Ø1”1/2
RI	HEATING RETURN	Ø1”1/2
AB	HTG FLOW TO DHW STORAGE CYLINDER	Ø1”
RB	HTG RETURN FROM DHW STORAGE CYLINDER	Ø1”
G	GAS	Ø3/4”
SC	CONDENSATE DRAIN	Ø25
S	FLUE OUTLET	Ø100

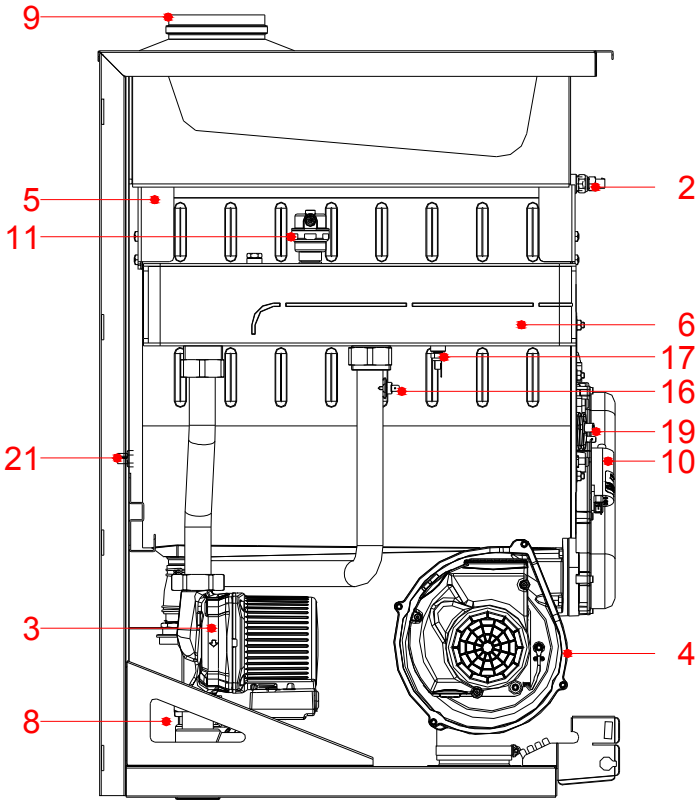
2.3 Internal parts of the boiler



RIGHT SIDE



FRONT SIDE



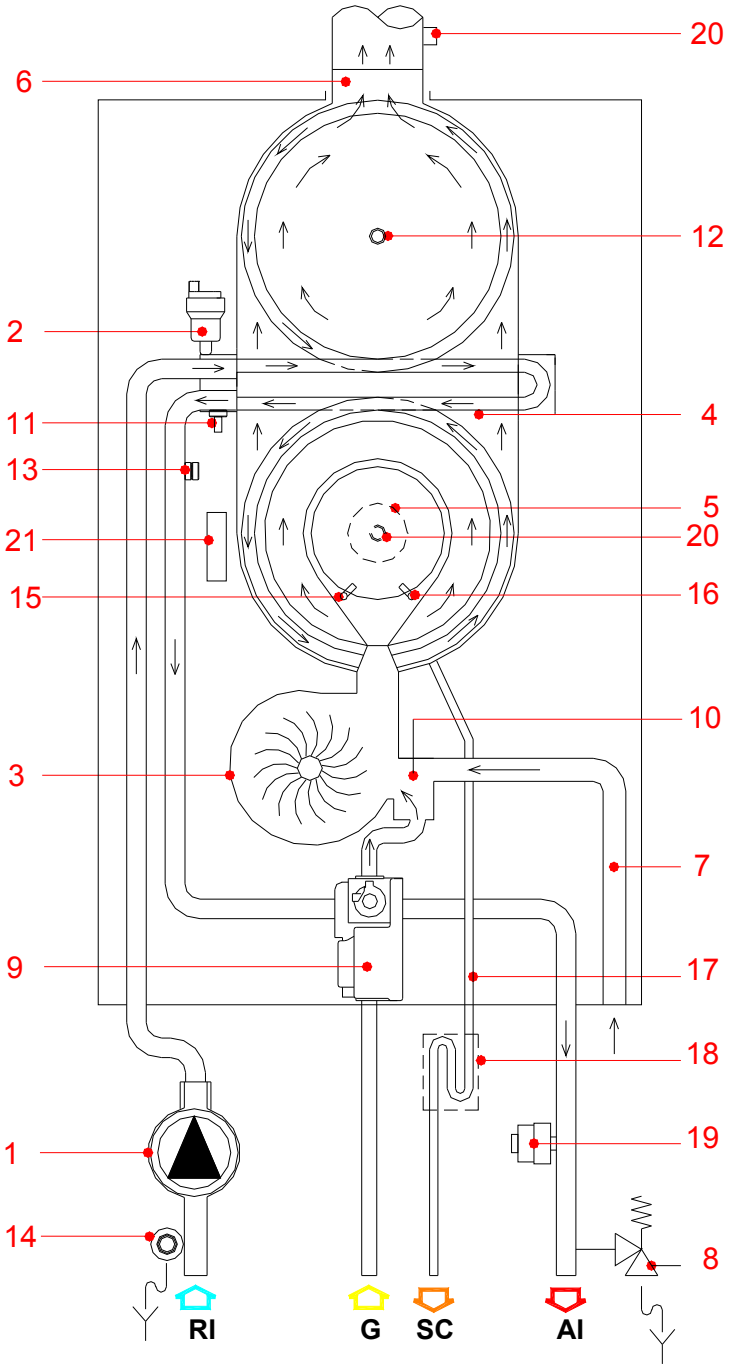
LEFT SIDE

Position	Description
1	WATER PRESSURE SWITCH
2	SAFETY THERMO FUSE 102 °C
3	PUMP
4	FAN RG128
5	CONDENSING EXCHANGER
6	MANIFOLD FLOW
7	MANIFOLD RETURN
8	CONDENSATE TRAP
9	FLUE EXHAUST DUCT
10	IGNITION TRANSFORMER
11	AUTOMATIC AIR VENT VALVE
12	AIR COMBUSTION INTAKE PIPE
13	3 BAR SAFETY VALVE
14	ELECTRONIC GAS VALVE
15	VENTURI
16	HEATING SAFETY THERMOSTAT 95 °C
17	HEATING SENSOR
18	IONISATION ELECTRODE
19	IGNITION ELECTRODE
20	SYSTEM DRAIN VALVE
21	SAFETY THERMO FUSE 318 °C

Fig. 1

2.4 Water circuit

1 PUMP WITH AIR VENT
2 AUTOMATIC AIR VENT VALVE
3 FAN RG128
4 CONDENSING EXCHANGER
5 BURNER
6 FLUE EXHAUST DUCT
7 AIR COMBUSTION INTAKE PIPE
8 3 BAR SAFETY VALVE
9 ELECTRONIC GAS VALVE
10 VENTURI
11 HEATING SAFETY THERMOSTAT 95 °C
12 SAFETY THERMO FUSE 102 °C
13 HEATING SENSOR
14 SYSTEM DRAIN VALVE
15 IGNITION ELECTRODE
16 IONISATION ELECTRODE
17 CONDENSATE PIPE CONNECTION
18 CONDENSATE TRAP
19 WATER PRESSURE SWITCH
20 SAFETY THERMO FUSE 318 °C
21 TRASFORMER



LEGEND		
AI	HEATING FLOW	Ø1”1/2
RI	HEATING RETURN	Ø1”1/2
G	GAS	Ø3/4”
SC	CONDENSATE DRAIN	Ø25

2.5 System mechanical circuit

2.5.1 Configuration n°1

Heating circuit installation controlled by a remote control and an outside temperature sensor (R version).

The boiler can manage the heating system with a fixed heating flow temperature or, in condition of climatic compensation, with an outside temperature sensor, by managing the modulation according to the requested thermic load.

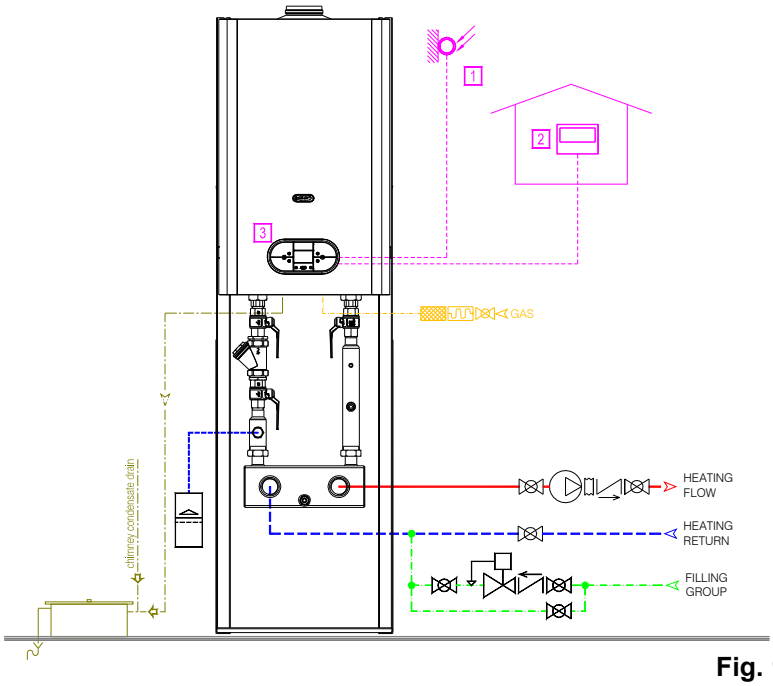


Fig. 1

2.5.2 Configuration n°2

Heating circuit installation controlled by a remote control and an outside temperature sensor + connection to a remote storage cylinder (RS version).

The boiler can manage the heating system with a fixed heating flow temperature or, in condition of climatic compensation, with an outside temperature sensor, by managing the modulation according to the requested thermic load.

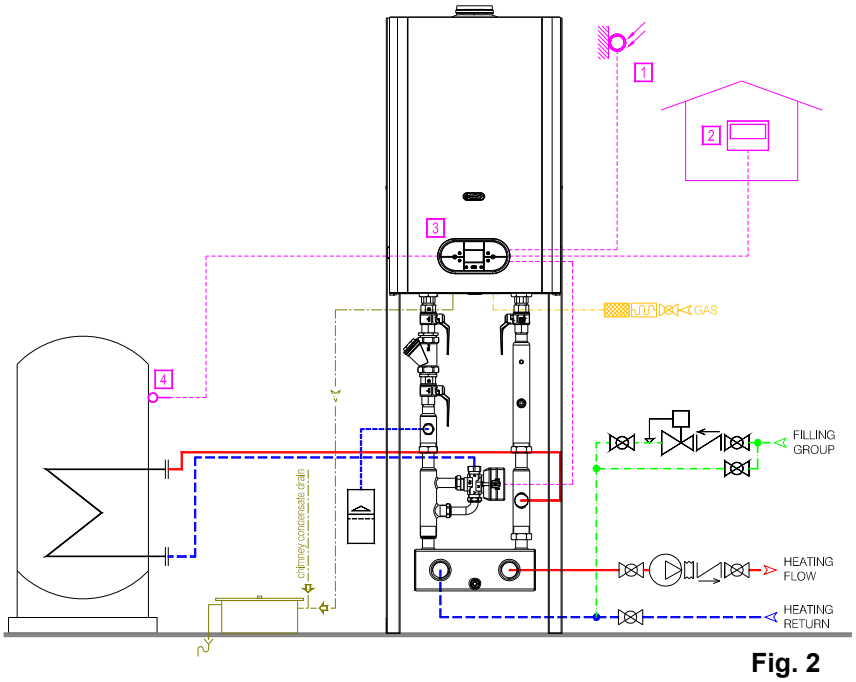


Fig. 2

pos.	description
1	OUTSIDE TEMPERATURE SENSOR
2	PRINTED CIRCUIT BOARD – CONTROL PANEL
3	REMOTO LCD OPEN THERM
4	DHW CYLINDER SENSOR

2.6 Circulation pump head/flow graph

2.6.1 Circulation pump typical curves.

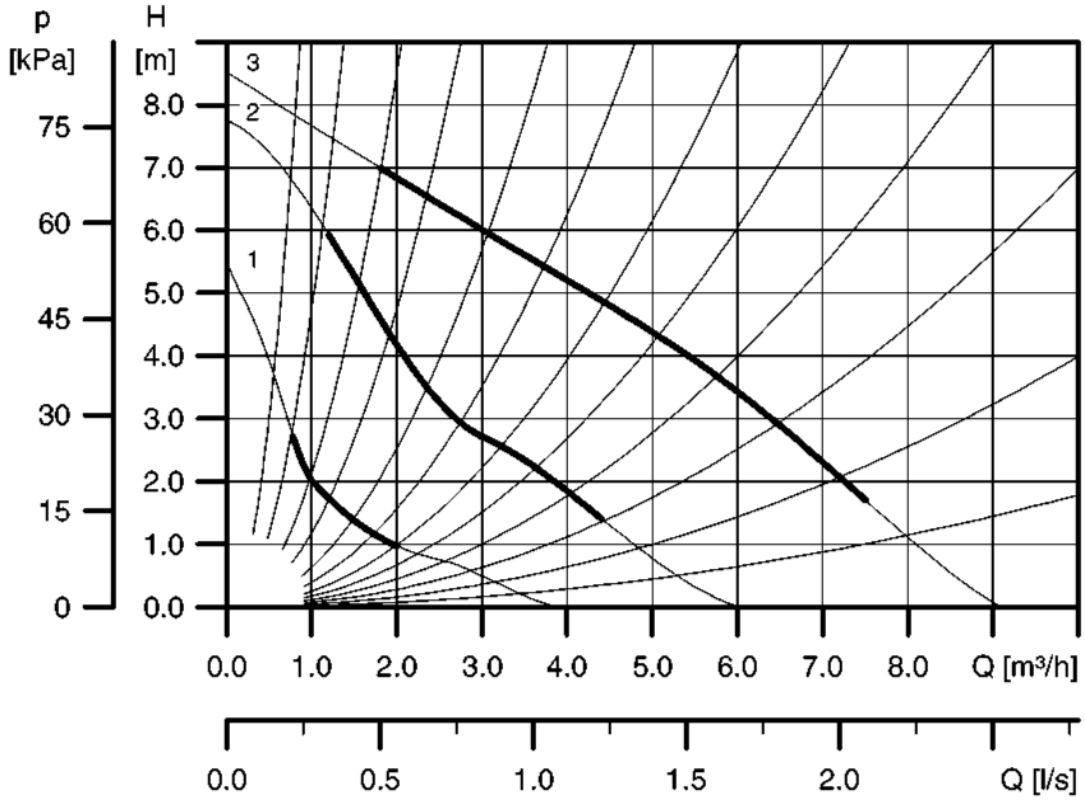


Fig. 1

2.6.2 Hydraulic pressure losses (Pressure loss mbar – Flow l/h)

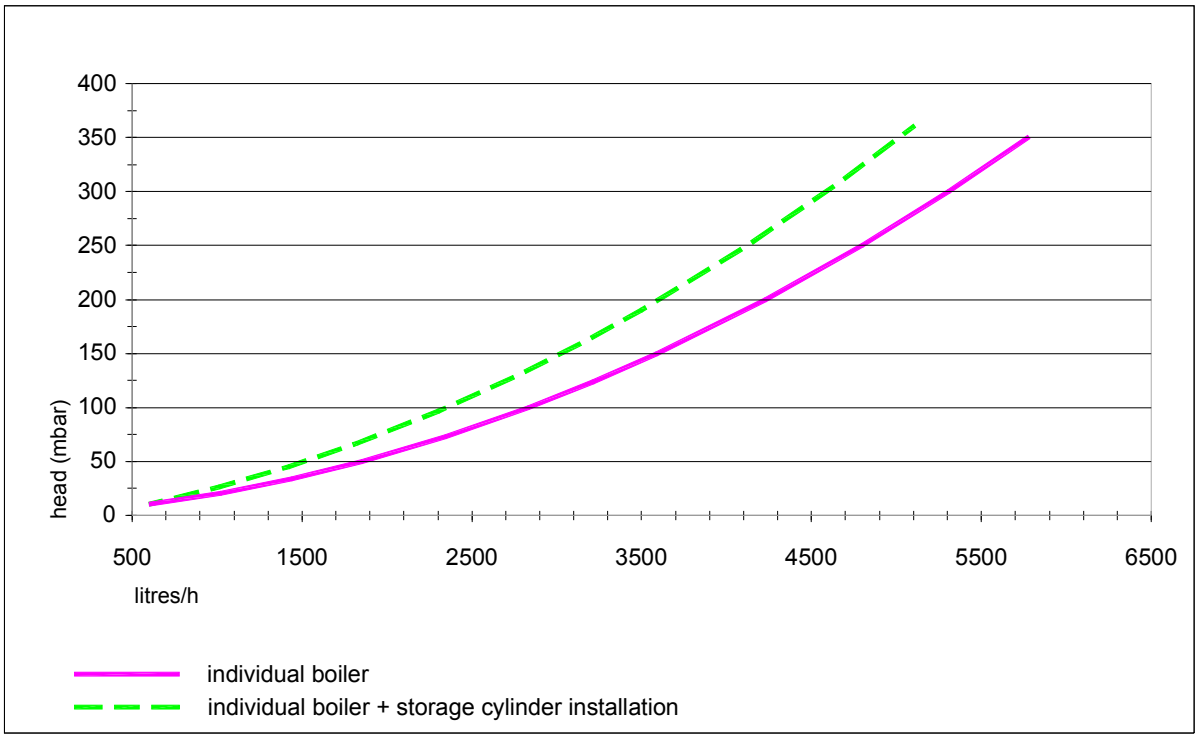


Fig. 2

2.7 System accessories

2.7.1 3-way valve kit

It's possible to connect the boiler to a remote storage cylinder for the domestic hot water production by installing a 3 – way valve kit.
The installation of a 3 - way valve kit (on the heating return) allows the boiler to manage the heating circuit in an indipendent way and assures the power supply of the serpentine according to the cylinder preheat request.
The kit includes a remote cylinder DHW temperature sensor and a 3-way valve power supply cable which is directly connected to the boiler PCB.

2.7.2 Hydraulic compensator

In order to guarantee a regular boiler functioning by avoiding scarce capacity's problems (due to obstructed radiators or impurieties), the installation of a hydraulic compensator is strictly necessary or, as alternative, the installation of a heat exchanger able to separate the hydraulic circuit.

The choice of a hydraulic compensator rather than another, exclusively depends on the type of the system.

Hydraulic compensator – code 26205LA

The installation of a hydraulic compensator is recommended in case of a new system or a boiler replacement where a pipes flushing is possible. (fig. 1).

The compensator will create a low pressure loss zone so that the primary circuit (of the boiler) will become independent from the secondary circuit. Therefore the installation of the hydraulic compensator allows a constant flow rate circuit and a variable flow rate distribution circuit, typical conditions of the modern heating systems.

A particular attention must be reserved, during the planning phase, to the possible temperature variations that circuits can suffer due to the mixing inducted into the hydraulic compensator. A secondary circuit with a higher capacity than that circulating in the primary circuit creates, through the hydraulic compensator, a heating flow temperature which is lower than the primary circuit temperature.

Plate exchanger

In case of a standard boiler's replacement in an old system with impurities and in case of problems during the system flushing, the installation of a heat exchanger is recommended to prevent boiler's obstructions that might compromise its functioning. The heat exchanger, interface between the primary circuit which includes the boiler and the secondary circuit, guarantees a real separation of thermal carriers flows and the consequently boiler safeguard. Unfortunately in this case, a real separation of flows provokes a real output loss from the system.

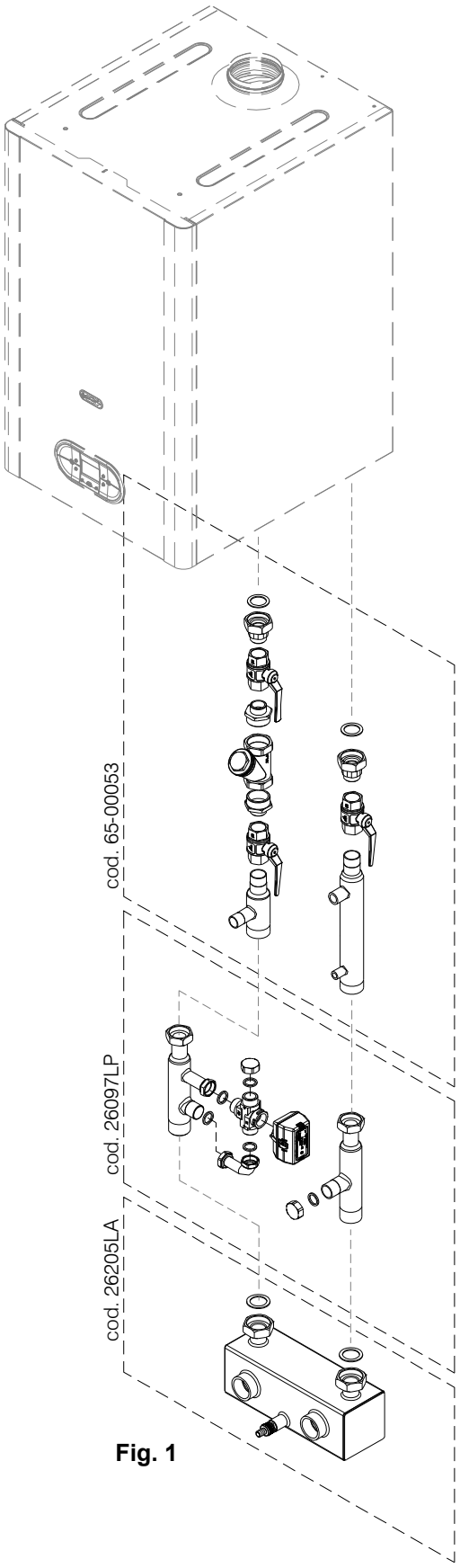


Fig. 1

2.8 DIGITECH® CS Printed Circuit Board MIAH400

Technical characteristics

Adjustments for service personnel only

- Standard (30/80°C) / reduced (25-45°C) central heating temperature
- Water hammer prevention function
- Central Heating timer - (adjustable from 0 to 7,5 minutes)
- Central Heating pump overrun timer
- Domestic Hot Water pump overrun timer *(RS version only - with connection to a remote storage cylinder)*
- Minimum Gas pressure setting
- Maximum Heating Load
- Heating output rising time
- Central heating maximum and minimum Set Point adjustment
- *Domestic Hot Water maximum Set Point Adjustment (RS version only - with connection to a remote storage cylinder)*
- Bus adjustment input 0-10V

User settings

- Heating Temperature setting (30-80°C) – (25-45°C)
- D.H.W. temperature setting (35-60°C) *(RS version only - with connection to a remote storage cylinder)*
- Summer only mode / Winter only mode / Summer + Winter mode selection *(if only heating the boiler is set to "heating only" or "OFF")*

Operation/Functions display

- Lock-Out
- Water low pressure
- Temperature display
- Flame presence ON (3 power steps)
- Error History display (last 5 errors)

➔ ***To switch the boiler OFF, press INFO button, the symbol appears on the display. The central heating frost protection system and the circulating pump inactivity protection functions remain enabled.***

➔ ***If the boiler was previously ON, it is switched OFF and the fan overrun and pump overrun functions are enabled.***

2.9 Control panel

2.9.1 Control panel Key (fig. 1)

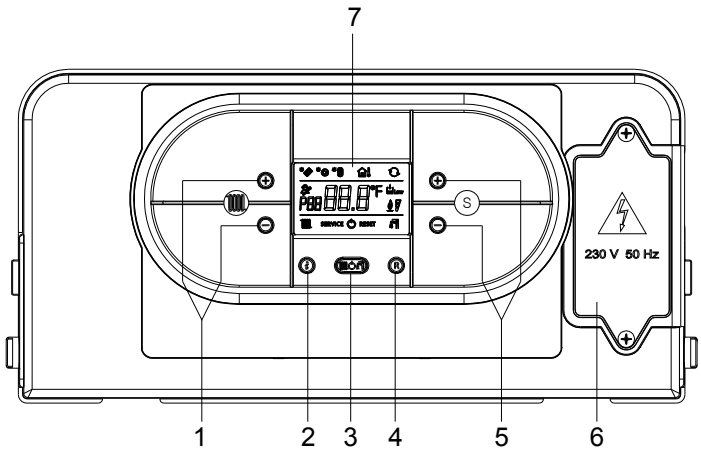


Fig. 1

1. **HEATING TEMPERATURE SETTING BUTTONS**
2. **INFO BUTTON:** PRESS ONCE TO DISPLAY TEMPERATURES AND INFO (see 2.10 “INFO menu display”). KEEP INFO BUTTON PRESSED FOR 5 SECONDS (in OFF MODE) TO DISPLAY THE LAST 5 ERRORS.
3. **MODE SELECTION BUTTON** SUMMER ONLY / WINTER ONLY / SUMMER-WINTER / OFF.
4. **RESET BUTTON:** ERROR RESET – FLUE TEST FUNCTION ACTIVATION (CHIMNEY-SWEEPER - KEEP IT PRESSED FOR 7 SECONDS).
5. **DOMESTIC HOT WATER TEMPERATURE SETTING BUTTONS** *(RS version only - with connection to a remote storage cylinder).* KEEP BUTTONS ‘+’ AND ‘-‘ PRESSED FOR 5 SECONDS TO ACTIVATE THE DISPLAY BACKLIT MODE FOR A CONTINUOUS PERIOD OF 10 MINUTES.
6. TERMINAL BLOCK FOR EXTERNAL WIRING.
7. LCD DISPLAY.

2.9.2 LCD display icons' key

1. PARAMETER NUMBER INFORMATION
2. PARAMETERS PROGRAMMING MODE ON
3. SOLAR PCB CONNECTION INFORMATION / SOLAR PANEL TEMPERATURE DISPLAY (d6)
4. SOLAR PUMP ON
5. STORAGE CYLINDER LOW LEVEL TEMPERATURE VISUALIZATION (d7) / STORAGE CYLINDER HIGH LEVEL TEMPERATURE VISUALIZATION (d8) *(RS version only - with connection to a remote storage cylinder)*
6. OUTDOOR TEMPERATURE SENSOR CONNECTED / OUTDOOR SENSOR TEMPERATURE DISPLAY (d2)
7. TEMPERATURE / SET POINT / PARAMETER VALUE INFORMATION
8. OPEN THERM COMPONENTS COMMUNICATION CONNECTED (REMOTE CONTROL / ZONE MANAGEMENT CONTROL BOX)
9. WATER LOW PRESSURE INFORMATION
10. (*) FLAME PRESENCE ON (3 POWER STEPS)
11. D.H.W. MODE ENABLED *(RS version only - with connection to a remote storage cylinder)*
12. RESETTABLE ERROR DISPLAY
13. OFF MODE
14. NOT RESETTABLE ERROR DISPLAY
15. HEATING MODE ENABLED

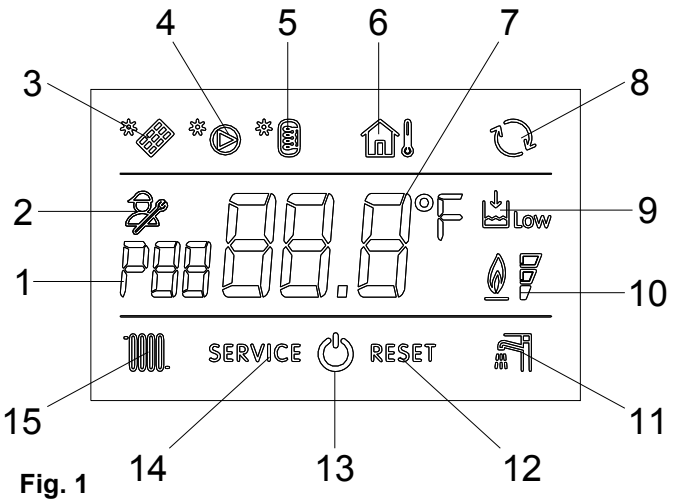


Fig. 1

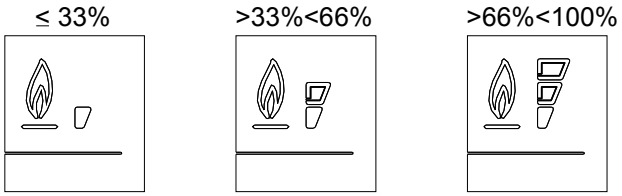


Fig. 2

10 (*) - During the boiler operation the display can show 3 different power levels according to the flame modulation of the boiler. (see flame icon/power % images)

2.10 INFO Menu display

Press the ' ⓘ ' INFO Button to display the boiler data.
Once pressed, the parameter number will appear on the left side of the display and the associated parameter value will appear on the centre of the display. Use ' ⊕ ' and ' ⊖ ' buttons of Heating Temperature setting to scroll the list of available data.
Press the ' ⓘ ' INFO button to exit the display mode.
The list of available display data is the following:

Parameter	Icon	Description
d00		DHW sensor temperature *(RS version only - with connection to a remote storage cylinder)*
d01		Outdoor sensor temperature *(only with outdoor temperature sensor)*
d2		Fan speed
d3		Low temperature circuit sensor *(only with Zone PCB CRAD0 connected)*
d4		Heating return sensor temperature *(only with PWM control electronic circulator)*
d5		Solar panel sensor temperature *(only with Solar PCB connected)*
d6		Solar storage cylinder temperature (low level) (*only with Solar PCB connected)*
d7		Solar storage cylinder temperature (high level) (*only with Solar PCB connected)*
d8		Solar panel sensor temperature 2 *(only with Solar PCB connected)*
d9		Solar storage cylinder temperature (extra) *(only with Solar PCB connected)*

3. INSTALLATION (authorised personnel)

3.1 General warnings

⚠ **Professionally qualified personnel in accordance with current laws and standards and in line with the manufacturer's instructions must install the appliance.**

⚠ **The boiler must be used to heat the water to a temperature inferior to that of ebollution and it must be connected to an heating system suitable to its performances and power (see "*2.1 Technical data*").**

⚠ **To prevent condensate stagnation inside the heat exchanger, make sure that the boiler is slightlty bent toward the back side (3/4°) to allow the condensate discharge through the opposite condensate drain pipe** *(see 3.5.2 Fixing the boiler to wall"; 3.5.3" Installation Frame - Individual installation")*

. ⚠ **Before proceeding with the water connections of the boiler, it is good practice to de-scale and clean out the system, to remove any impurities that might compromise the proper working operation of the heating unit in case both the system is existing or of new installation.**

⚠ **Before starting up the boiler, make sure that the type of gas corresponds to that for which the appliance has been set-up (see gas type label inside the boiler).**

⚠ In case of boiler connection to existing flue-hoods, check that these have been perfectly flushed to remove any residues that, by coming off from them, could compromise the flue exhaust and cause dangerous situations.

⚠ In case of boiler connection to unsuitable flue-hoods, check that they have been intubated.

⚠ In case of new boilers or boiler replacements, the system must be equipped of efficient devices which provide the boiler against air and impurities: Y filters, micro impurities and micro air-bubbles' separators.

⚠ Check that the water treatment has been previewed as required by the current law (see *"4.3.2 System water features"*). In case a frost protection fluid is necessary, check it is approved by the manufacturer.

⚠ Make sure that the installation place and the devices necessary to the boiler connection comply with current standards and regulations.

⚠ For the creation of a technical protected place, make sure the minimum distances are respected and allow access to the interior of the boiler (see "*3.5 Installing the boiler"*) in accordance with current standards and regulations.

⚠ Check the system gas capacity as required by the current standards. Protect the connecting pipes to avoid their damage.

⚠ The safety valve discharge must be connected to a condensate trap with the possibility of a visible check to avoid, in case of operations to the boiler, damages to persons, animals and things for which the manufacturer is not responsible.

- **Check that the expansion vessel has a capacity suitable to the content of the system water.**

3.2 Reference standard

- IPX4D rating for electrical appliances.
- EMC DIRECTIVE 89/336 CEE
- LVD DIRECTIVE 73/23 CEE
- BOILER EFFICIENCY DIRECTIVE 92/42 CEE
- UNI EN 677 for GAS-FIRED CENTRAL HEATING BOILERS. SPECIFIC REQUIREMENTS FOR CONDENSING BOILERS WITH NOMINAL HEAT INPUT ≤ 70 kW

The manufacturers instructions form an integral part of the installation and should be left with the appliance but do not over ride in anyway statutory obligations.

3.3 Boiler room – Installation requirements

Please refer to local and national standards in force in the Country of destination of the product. In particular the manufacturer recommends:

⚠ For the creation of a technical protected place, in order to allow access to all the safety devices and for maintenance purposes, it is important that minimum distances are respected.

⚠ The boiler can be installed externally, in a partially protected place in conformity with local Building Regulations and if the outside minimum temperature is not lower than –10°C, by assuring electrical and gas supply to the boiler.

3.4 Unpacking

- **The materials (cardboard) used for packing the appliance are fully recyclable.**
- **It is recommended that the packing material is only removed prior to installing the boiler. The manufacturer will not be held responsible for damage caused by incorrect storage of the product.**
- **Packing materials (plastic bags, polystyrene, nails, etc.) must not be left within reach of children, in that these items represent a potential hazard.**

A. Place the packed appliance on the floor (see fig. 1) making sure that the "up" arrow is facing down. Remove the staples and open out the four flaps of the box.

B. Rotate the boiler 90° while manually supporting it from underneath

C. Lift the box and remove the protections. Lift the boiler by grasping the rear part and proceed with the installation.

STORAGE & HANDLING

Please note that prior to installation the Radiant boilers should be stored in the horizontal position with no more than three boilers to a stack;
Ensure that the boilers are stored in dry conditions and be aware that the carton is a tow-man lift;

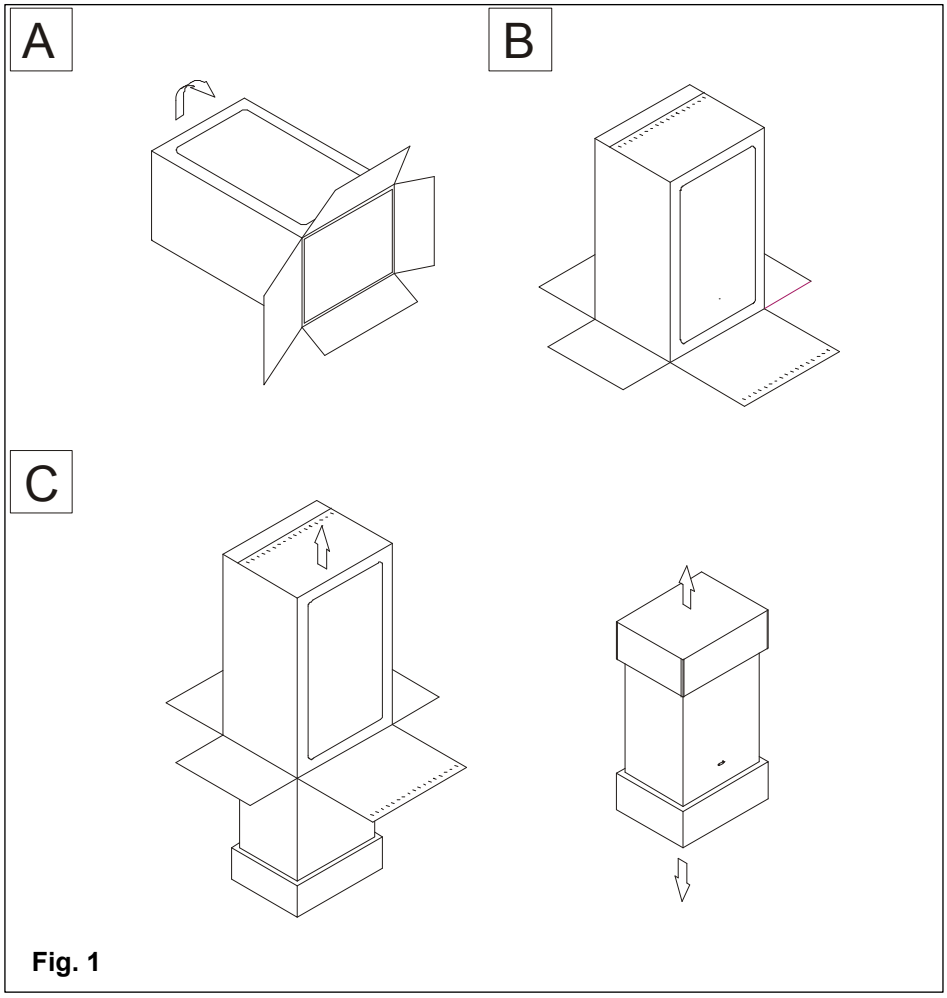


Fig. 1

3.5 Installing the boiler

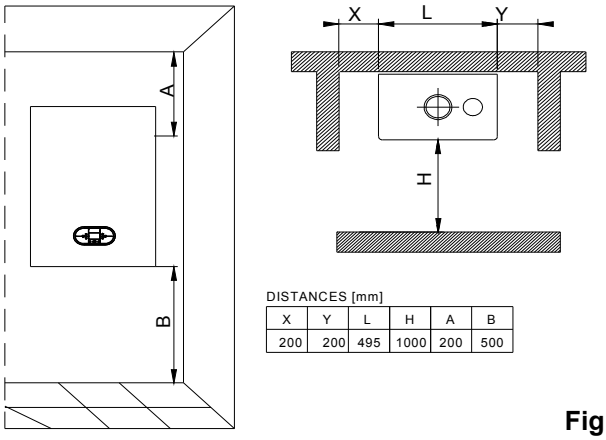
3.5.1 Minimum distances

⚠ The appliance must be installed exclusively on a vertical solid wall capable of supporting its weight. The boiler should be fitted within the building unless otherwise protected by a suitable enclosure i.e. garage or outhouse. (The boiler may be fitted inside a cupboard).

- If the boiler is sited in an unheated enclosure then it is recommended to leave the ON/OFF switch always in ON position to give frost protection.
- If the boiler is installed in a room containing a bath or shower reference must be made to the relevant requirements.

⚠ **Boilers can be installed externally, in a partially protected place (balcony – see fig. 2) in conformity with local Building Regulation and if the outside minimum temperature is not lower than –10°C. The manufacturer is not responsible for external installations where the outside temperature is lower than – 10°C or not in conformity with above instructions.**

In order to allow access to the interior of the boiler for maintenance purposes, it is important that the minimum distances indicated in figure 1 are respected.



DISTANCES [mm]

X	Y	L	H	A	B
200	200	495	1000	200	500

Fig. 1

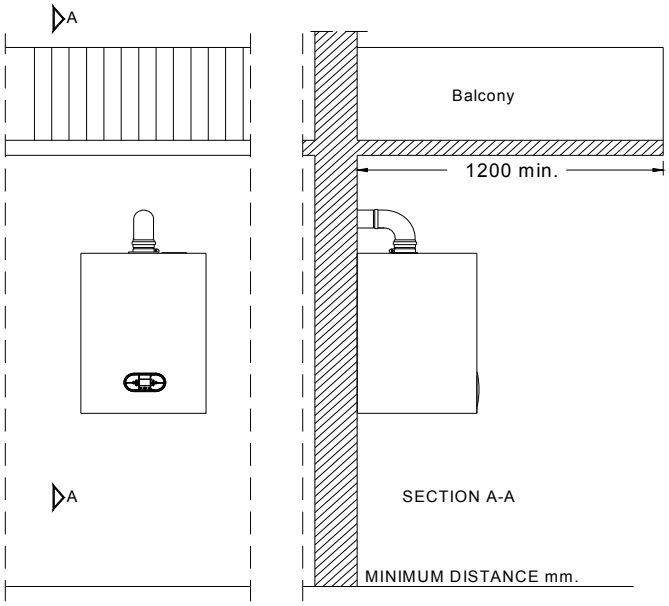


Fig. 2

3.5.2 Fixing the boiler to wall.

The appliance must be installed exclusively on a flat vertical solid wall capable of supporting its weight.

To avoid the condensate stagnation within the condensing exchanger, make sure that the boiler is slightly inclined to the rear (Slope = 4°) to allow the correct draining of the condensate.

To fix the boiler to wall follow this instruction:

1. Check that the spacer A (fig.1) is installed in the boiler to ensure the correct installation slope of 4° compared to the installation wall (fig. 2) and to avoid any condensate stagnation within the condensing exchanger;
2. Fix the external part of the mounting bracket to wall (fig. 1) using proper screw anchors and following the distances shown in fig.3;
3. Insert the inner guide of the mounting bracket;
4. Hang the boiler onto the special hooks;
5. Once the fixing is completed check that the 4° slope (fig. 2) is respected;

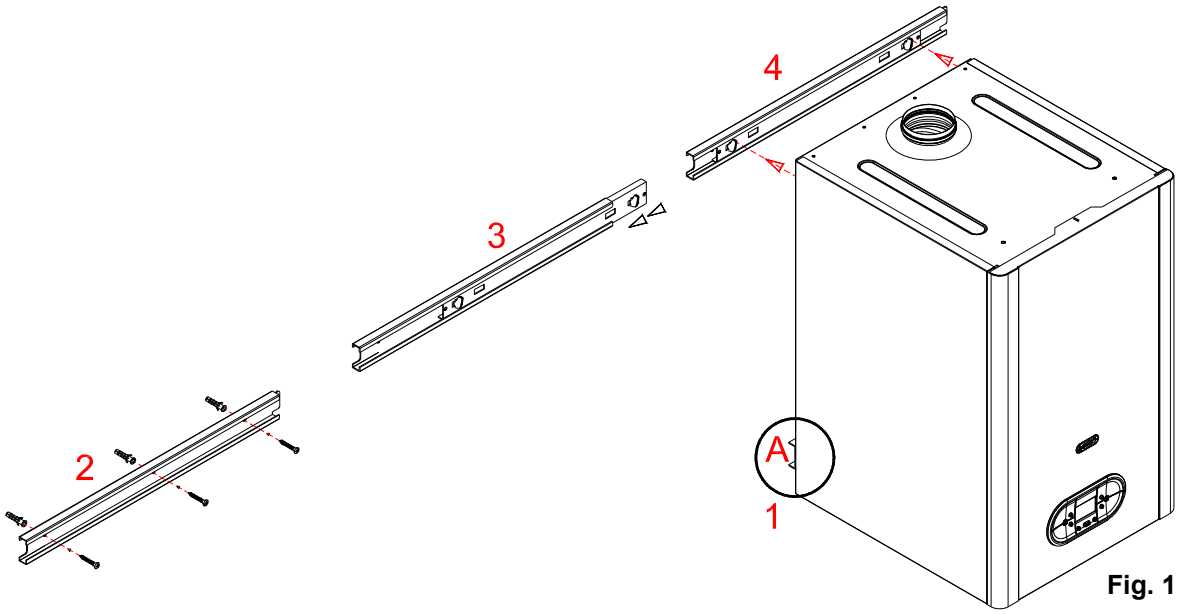


Fig. 1

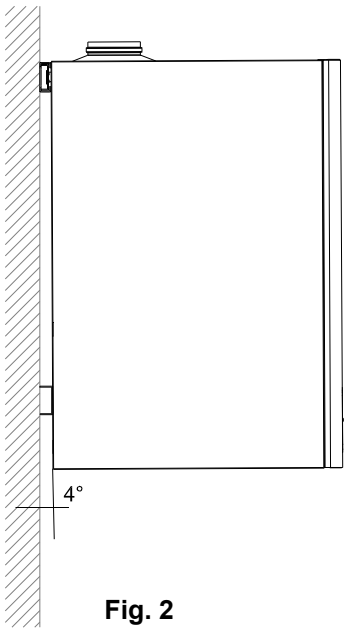


Fig. 2

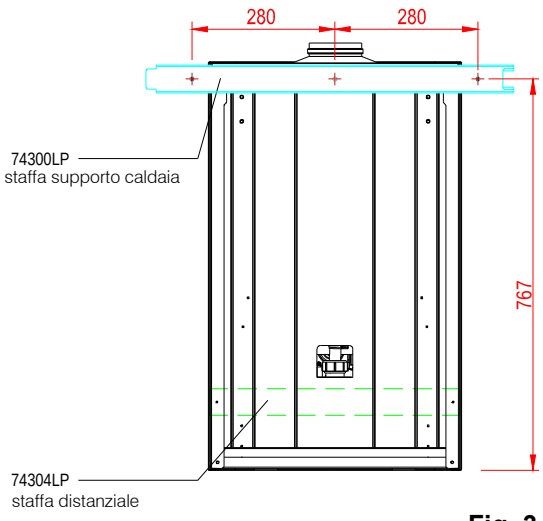


Fig. 3

3.5.3 Installation Frame - Individual installation

Prior to fixing the appliance to the wall, pay the maximum attention to the installation of the installation frame. The frame must be based on a plane surface and it must be perfectly installed at right angels. Incorrect boiler grades can provoke a wrong condensate discharge through the condensate drain pipe and the consequently condensate stagnation inside the heat exchanger. A correct frame installation assures a counterslope of about 4° compared to wall perpendicular line.

To install the frame and than the boiler, proceed as follows:

a. Make sure that the wall and the floor form a right angel;

b. Fix the lateral profiles **3** and **4** to the vertical brackets **1** and **2**;

c. Fix the vertical brackets **1** and **2** to the horizontal bracket **6**;

d. Fix the central and bottom brackets **7** and **8**;

e. Once the assembling has been completed, place the frame by fixing it to the wall **9** and to the floor **10**;

f. Install the boiler on the frame by using the apposite hooks **11** and complete the installation with the hydraulic components mounting.

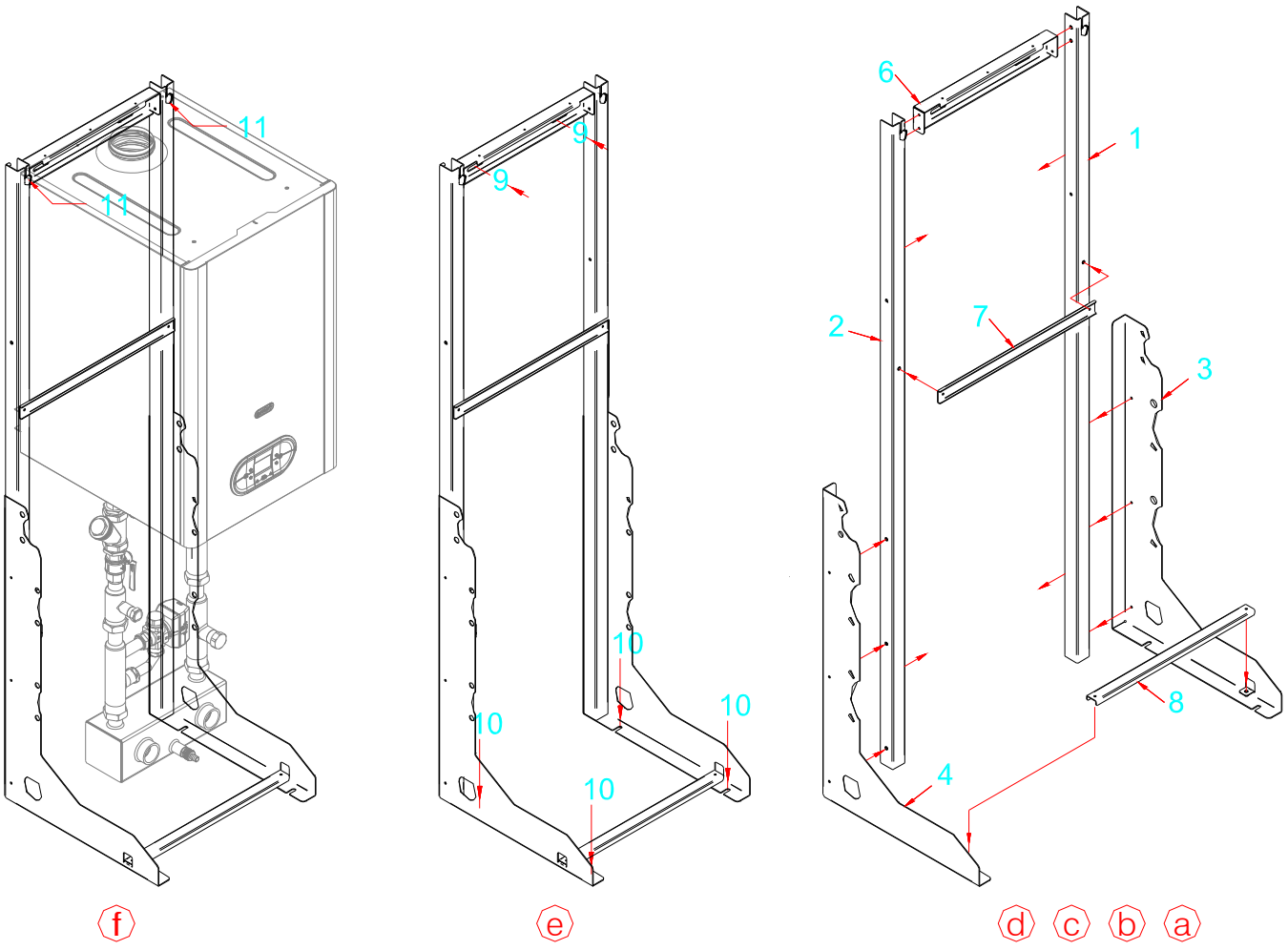


Fig. 1

3.6 Water connections

3.6.1 General warnings

The water connections must be carried out by professionally qualified personnel in accordance with relevant standards.

It is recommended that the system is hot-flushed to remove any impurities (especially oil and grease) that might compromise the proper working operation of the heating unit, from the pipes and radiators.

Make sure that the central heating pipes are not used to earth the electrical system. The pipes are totally unsuitable for this purpose.

The unit should be filled slowly to allow the air to escape through the manual valve fitted as standard on the unit; check in addition that all the air has been completely purged from the other parts of the circuit and that the pressure when cold is about 1.2 ÷ 1.5 bar or in any case the pressure set by the heating engineer.

Connect the outlets of the safety valves to an outlet funnel to prevent the boiler room from flooding if these devices cut in. This outlet should preferably be sent to the outside so as to avoid damage to persons or property caused by hot water in the event that the valve should open.

On systems with a closed expansion tank, the pressure reducer on the automatic supply unit (where available) should be set to a pressure that will not exceed the initial design setting.
Make sure that while the equipment is working the system pressure does not exceed the working pressure for each component.

It is always advisable to fit the unit in an accessible position to facilitate periodic cleaning operations.

To prevent vibration and noise coming from the system, do not use pipes of reduced diameter, short radius elbows or severe reductions in the cross sections of the water passages.

3.6.2 Hydraulic connections

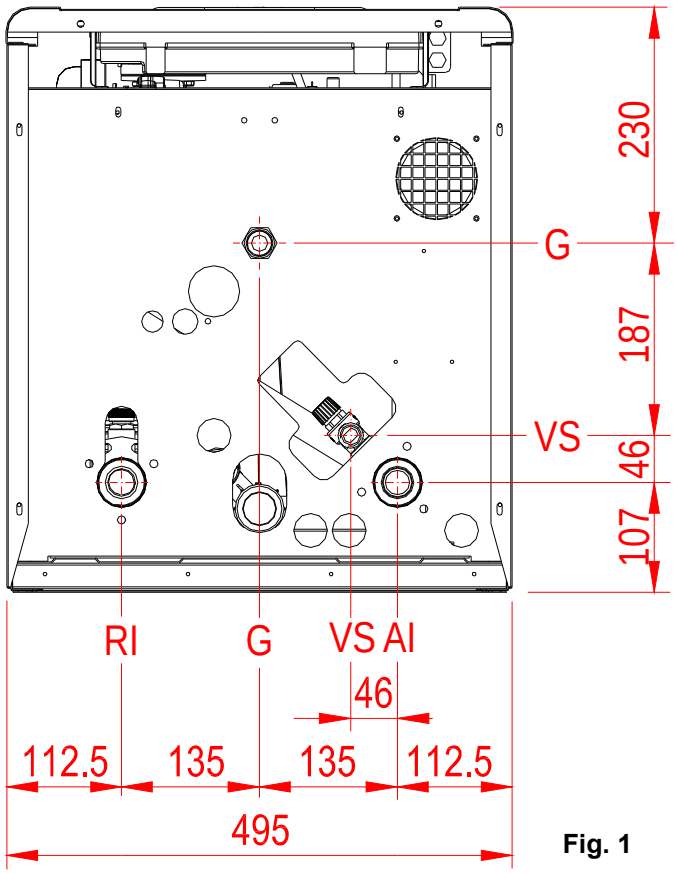


Fig. 1

LEGEND

RI	HEATING RETURN	Ø1”1/2
AI	HEATING FLOW	Ø1”1/2
G	GAS	Ø3/4”
SC	CONDENSATE DRAIN	Ø25
VS	SAFETY VALVE DISCHARGE	Ø1/2”

3.6.3 Central heating circuit

In order to prevent scaling or deposits in the primary heat exchanger, the mains supply water to the heating circuit must be treated according to the requirements of local standards.
This treatment is indispensable in the case where the circuit is frequently topped-up or when the system is often either partially or fully drained.

The outlet connection of the boiler safety valve must be connected to a discharge trap. The manufacturer will not be held responsible for flooding caused by the operation of the safety valve in the case of system overpressure.

3.6.4 Condensate Drain

⚠ **Properly connect the siphon condensate collecting the boiler to an exhaust system having adequate slope. Where possible, you should make this link using glass collection in order to check for proper condensate drainage avoiding stagnation that could cause hazardous lift the condensate to the boiler.**

⚠ **Check before connecting the condensate trap to the drain pipe, which is ensured by the gradient of boilers as described in paragraphs 3.5.2 and 3.5.3.**

The condensate water inflow into the public drainage system, must be in compliance with the municipal standards referring to the sanitary regulations' wastewaters.
The condensate drain system is already pre-installed and connected to each boiler.
The condensate drain flexible pipe supplied with the boiler (conforming to UNI EN 677 standard) must be connected to a proper condensate trap. The condensate discharge into the drainage system is allowed providing a condensate trap (siphon) is installed.

It will be care of the planner, in consideration of the system power and the building's use destination, to value the adoption of acid condensate neutralization systems.

Any condensate discharge pipe work external to the building (or in an unheated part of it) must be insulated to protect against frost. Before switching the boiler On, check the correct condensate discharge.

3.6.5 Condensate neutralization

The condensate neutralization system neutralizes the condensate present in boilers and Inox, plastic, glass or ceramic flue exhaust systems.
Acid condensate, introduced into the neutralization box, follows a two-steps set course. First phase: nitrates and sulphates filtration through active carbons contained in the first part of the carbon site pipe. Second phase: pH rising. The acidity of the condensate can be controlled through the use of appropriate tools for the determination of Ph, such as the litmus paper. Neutralized condensate can be consequently carried to the drainage system.

- **Installation instruction**

a. *Assembly of threaded joint to discharge into the drainage system:* make a hole D.26-27 mm on long or short side of the box, to a height of 20 mm from the border, (see fig. 1 – page 22): According to the type of the installation, the hole can be made on longitudinal or transversal side. Put the joint assembled with the washer, from the outside and fix it from the inside with the 3/4" nut.
b. *Condensate connection:* condensate to be neutralized must be carried to the condensate collector hole (26 mm) on the cover; the rubber holder joint must be connected to the wastewater evacuation system in a disjointed way through the installation of a condensate trap;
c. *Box loading:* place the bag containing activate carbons in the carbon site pipe corresponding to the condensate collector hole. Pour the content of the granulate bag outside the carbon site pipe.

- **Maintenance**

pH parameters must be included between <5,5 – 9,5>

Six-monthly.
pH determination:
Immerse a litmus paper (or an appropriate digital tool) to the condensate near the threaded joint for about 2 seconds and put it onto a white sheet. After about 30 seconds the comparison with the coloured scale will be possible.
Neutral point is on the 6,8-7 value; in case of lower value the condensate is acid, in case of a higher value it is basic.
No-trated condensate pH can be determinated by immersing the litmus paper inside the carbon site pipe.

Active carbon:
Check the water surface in the box and, if oily traces appear, replace the active carbon bag. Active carbon's saturated filters can be eliminated as urban waste material and they could be reduced to ashers in water treatment systems.

Removing the reagent:

Shake well the reagent granulate. The fluid becomes turbid, or rather the chalk or the magnesium sulphate melt and they could be eliminated with water.

Annual

Active carbon:
See six-monthly maintenance.
Reagent:
Determine the pH values and, if necessary, replace the reagent granulate (see six-monthly maintenance).

Drain the liquid content of the neutralizer box. Remove rubber holder joint and 3/4" nut. Remove all internal components (including syntetic filter) and wash carefully all internal parts. Reassemble the box by placing the components in orignal order (see *"installation instruction"*).

Disposal:

The reagent destination is the dump. The reagent doesn't contain toxic substances.

For the active carbons' filter, see "six-montly maintenance".

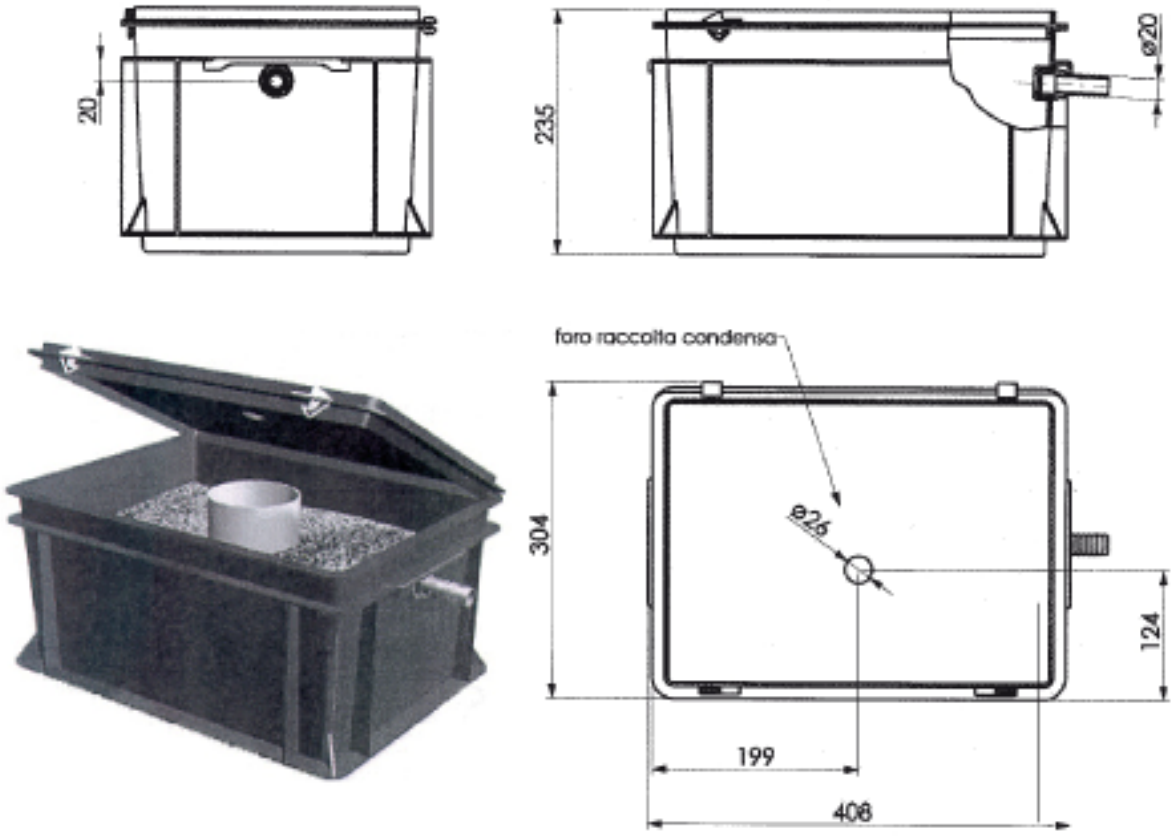


Fig. 1

3.7 Gas Connection

3.7.1 General warnings

⚠ **The connection to the gas supply must be carried out by professionally qualified personnel in accordance with relevant standards:**

⚠ **When connecting the boiler to the gas supply pipe, only use appropriate washers and gas fittings. The use of hemp, Teflon tape and similar materials is not allowed.**

⚠ **The flow rate of the gas meter must be sufficient for the simultaneous use of all devices connected to it. Connect the generator gas, according to the regulations. The diameter of the gas pipe coming out of the generator, is not decisive for the choice of the diameter of the hose between the unit and the meter. It must be chosen in function of its length and load losses as a result of calculation by a qualified technician. Check the nominal pressure provided to the counter as if insufficient can reduce the power of the generator with inconvenience to the user.**

Before installing the boiler, check the following:

- The pipe work must have a section appropriate for the flow rates requested and the pipe lengths installed, and must be fitted with all the safety and control devices provided for by current standards.
- The gas supply line must be a minimum of a 22 mm diameter pipe with an uninterrupted supply from meter to boiler and comply with current standards and regulations.
- ***Check the internal and external seals of the gas supply system.***
- A gas shut-off valve must be installed upstream of the appliance
- The gas pipe work must have and bigger or equal section to the one of the boiler.
- Before starting up the boiler, make sure that the type of gas corresponds to that for which the appliance has been set-up (see gas type label inside the boiler).
- The gas supply pressure must be between the values reported on the rating plate (see gas type label inside the boiler).
- Prior to installation, it is good practice to ensure that there are no machining residues on the gas supply pipe.

3.8 Electrical connections

3.8.1 General warnings

⚠ **The connection to the mains power supply must be carried out by professionally qualified personnel, registered in accordance with current legislation and authorised by Radiant Bruciatori s.p.a.**

⚠ **Always check to make sure that the appliance has an efficient earth system. This requirement is only satisfied if it has been properly connected to an efficient earth system installed in accordance with the requirements of current safety standards and carried out by professionally qualified personnel.**

This basic safety measure must be checked, verified and carried out by professionally qualified personnel.
In case of doubt, have the electrical system checked by a qualified electrician. The manufacturer will not be held liable for any damage or injury caused as a result of an inefficient or inexistent earth system;

- The boiler functions with an alternating current of 230 V and 50 Hz and has maximum power absorption of 180 W. **The appliance should be protected by a 3 A fuse.** The connection to the mains electricity supply must be via a single-pole switch, with at least 3 millimetres gap between open contacts, mounted upstream of the appliance. Make sure that the positions of the live and neutral wires correspond to the wiring diagram;

⚠ The power supply cable must not be replaced by the user. If the cable is damaged, turn off the unit and to replace it, contact a qualified technician. In case of replacement of the power supply cable, use a minimum cable 3 x 0.75 mm2.

- Ensure the domestic power supply is checked by a qualified electrician to ensure that it can support the maximum power absorption of the appliance, as indicated on the rating plate. In particular, make sure that the cable sizes are adequate for the power absorbed by the appliance;
- The power supply cable must not be replaced by the user. if the cable is damaged in any way, switch off the appliance and have the cable replaced by a suitably qualified electrician;
- When replacing the power supply cable, only use cables of the same characteristics (HO5 VV-F 3x1) with maximum external Ø 8 mm;

⚠ **CAUTION**: The room thermostat must be dry contact closure. Connecting the 230 V to the terminals of the room thermostat, will create a permanent damage to the electronic board.

When using an electrical appliance, a few fundamental rules must be observed:

- Do not touch the appliance with damp or wet parts of the body or when barefoot.
- Do not pull on the electric wires.
- Do not leave the appliance exposed to atmospheric elements (rain, sun, etc,) unless these conditions have been expressly provided for.
- Do not allow the appliance to be used by children or anyone unfamiliar with its operation;

3.8.2 Power supply connection

Connect the power supply to the terminal board inside the control panel as follows:

a. Switch off the power supply at the main switch.
b. Remove the front case panel of the boiler.
c. Slacken the screws and remove plate A (see fig. 1).
d. With the plate removed, connect the wires to the terminal board B as follows:

- Connect the earth wire (normally coloured green/yellow) to the terminal marked with the earth symbol " ⏚ ".
- Connect the neutral wire (normally coloured blue) to the terminal marked with the letter "N".
- Connect the live wire (normally coloured brown) to the terminal marked with the letter "L".
- Terminals identified by the letters: Ta ⇒ Room thermostat
  Se ⇒ Outside temperature sensor

When the wires have been connected, place plate "A" back to position.

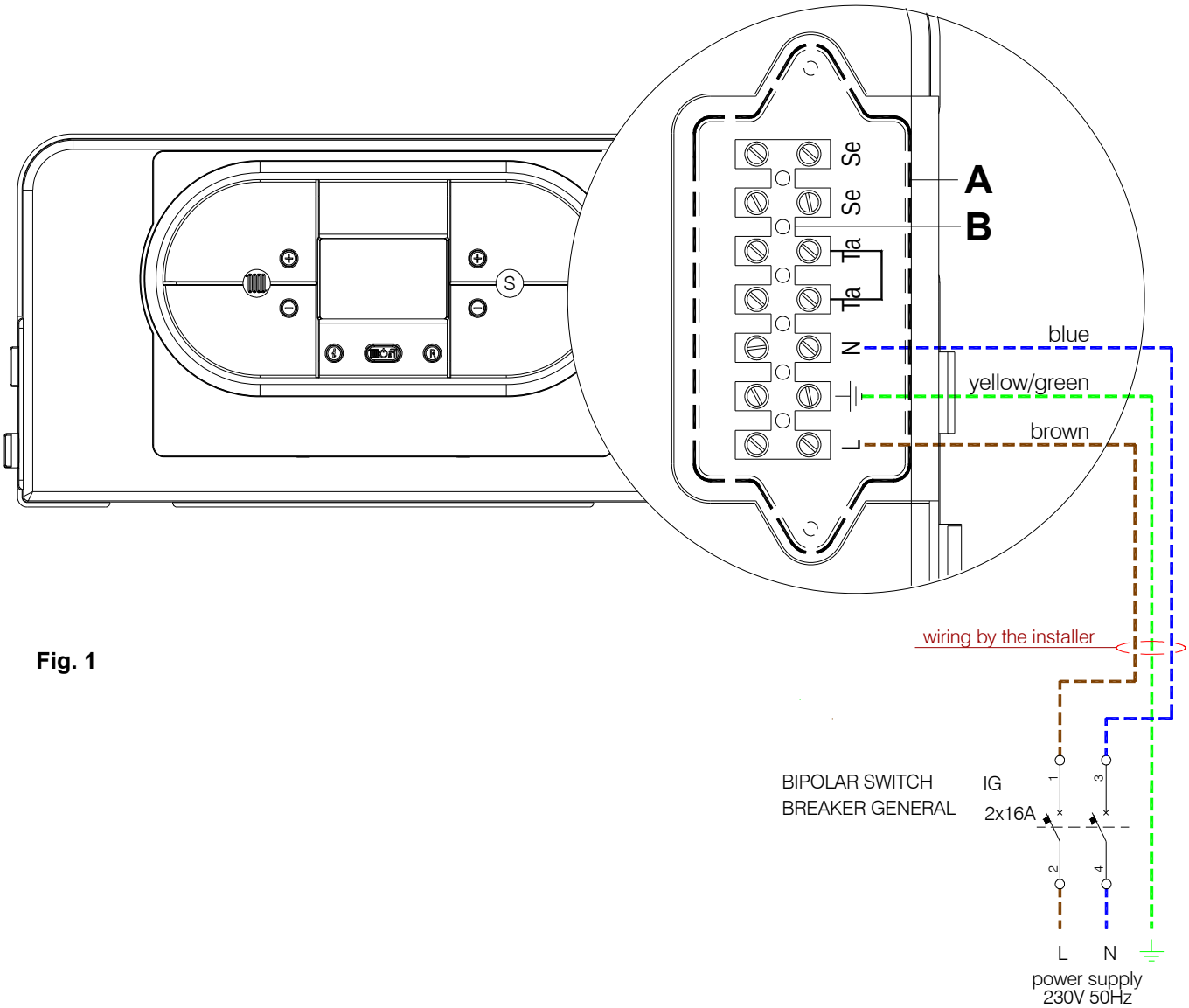


Fig. 1

3.8.3 Electrical connections (Option)

Remote control connection – cod. 40-00017

Outdoor temperature sensor cod. 73518LA

3.8.3.1 Remote control (option) connection

Connect the wires to the terminal board inside the instrument panel as follows:

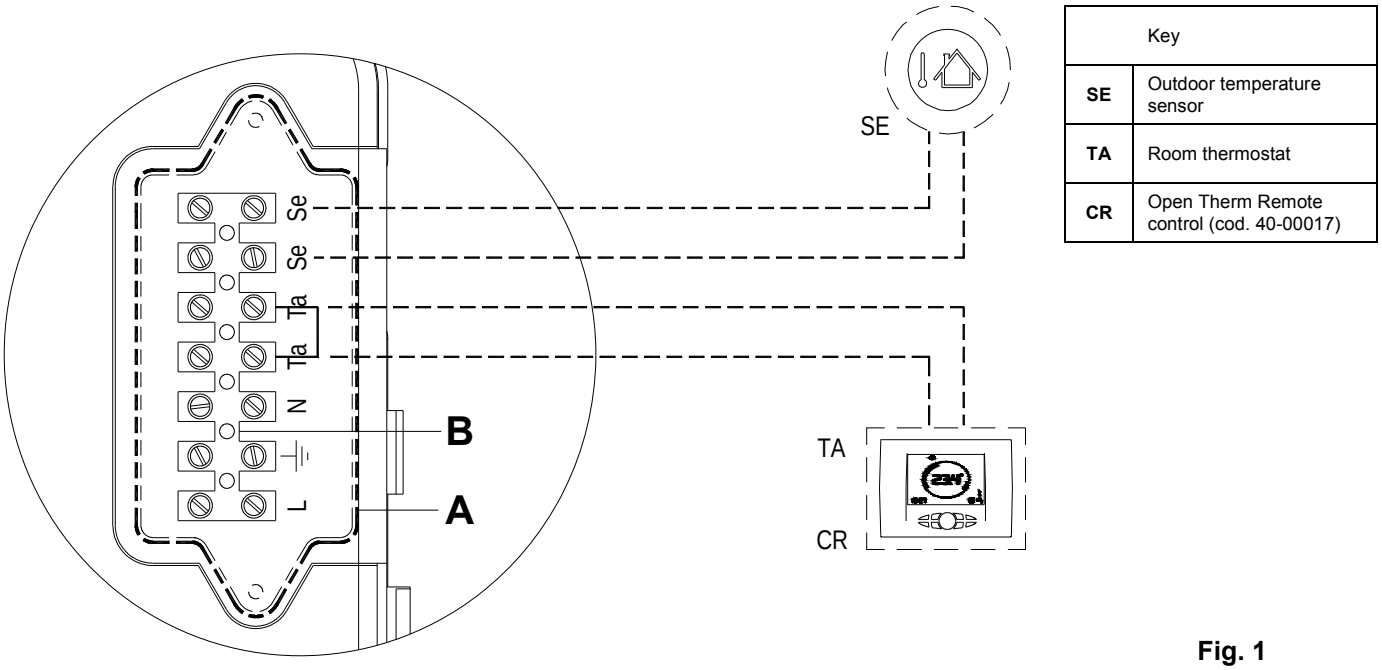
a. switch off the power supply at the main switch.
b. remove the front case panel of the boiler.
c. slacken the screws and remove plate **A** (see fig. 1).
d. remove jumper TA -TA from the terminal board **B**;
e. connect the remote control wires on contacts marked as TA-TA;

3.8.3.2 Outside temperature sensor connection (Option)

Connect the wires to the terminal board inside the instrument panel as follows:

a. switch off the power supply at the main switch.
b. remove the front case panel of the boiler.
c. slacken the screws and remove plate **A** (see fig. 1).
d. connect the outside temperature sensor on contacts marked as SE-SE on the terminal board **B** ;

When the wires have been connected, place plate "**A**" back to position and then the front case panel.



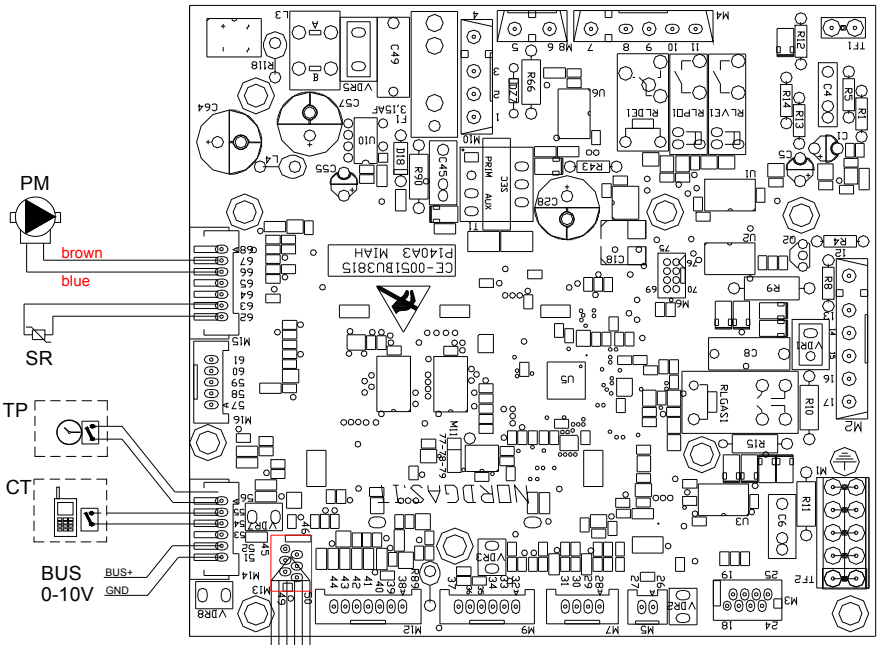
Key	
SE	Outdoor temperature sensor
TA	Room thermostat
CR	Open Therm Remote control (cod. 40-00017)

Fig. 1

Note: *in the case of simultaneous presence of outdoor temperature sensor and remote control, the electronic board only sends the value of outdoor temperature to the remote device without using it for the modulation. The remote device will use the value for modulation, if necessary. (See the manual of the remote).*
The communication between the electronic board and the remote control takes place regardless of the mode of operation selection made in the boiler, and once the connection is established, the onboard user interface is disabled and the display will show the symbol '

3.8.4 Electrical connections (Option)

Zone Valves Management PCB - Modulating pump
Storage cylinder pre-heating timer option - Telephone control



	Key
TP	Storage cylinder pre-heating timer option (only if parameter P00 = 2, 3 or 4)
CT	Telephone control
PM	Modulating pump
SR	Heating sensor
SRB	Remote boiler Lock-Out indicator Option
SVZ	Zone Valves Management PCB (if Remote control is installed)
TAZ 1	ZONE 1 Room thermostat
TAZ 2	ZONE 2 Room thermostat
VZ1	Zone valve 1
VZ2	Zone valve 2
VZR	Zone valve Remote control
FC	Zone valve limit switch
BUS 0-10V	Bus adjustment input 0-10V

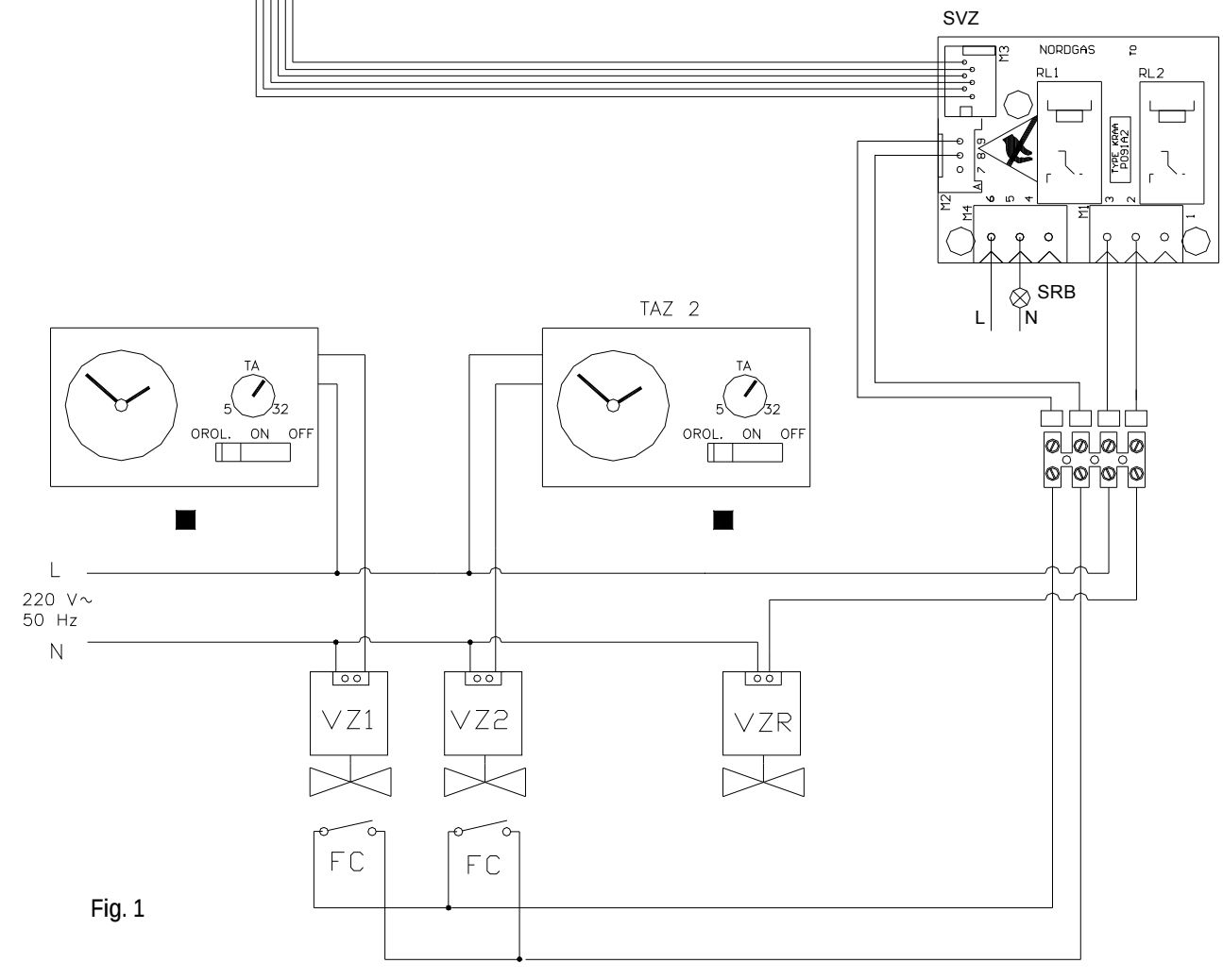


Fig. 1

3.8.5 3-way valve kit fitted for D.H.W. storage cylinder connection – D.H.W. sensor and *3-way valve cables connections*

- ***M9 terminal block DHW cylinder sensor***: insert the sensor cable inside the control panel inserting terminals 34 and 35. It is not necessary to follow a sequence with the wires.
- ***M4 terminal block – 3-way valve****:* connect the 3-way valve motor cable through the Molex terminal. Insert the cable inside the control panel and connect cable terminals to M4 terminal block respecting the following coupling: light-blue – terminal no.9; brown – terminal no.8; black – terminal no.10

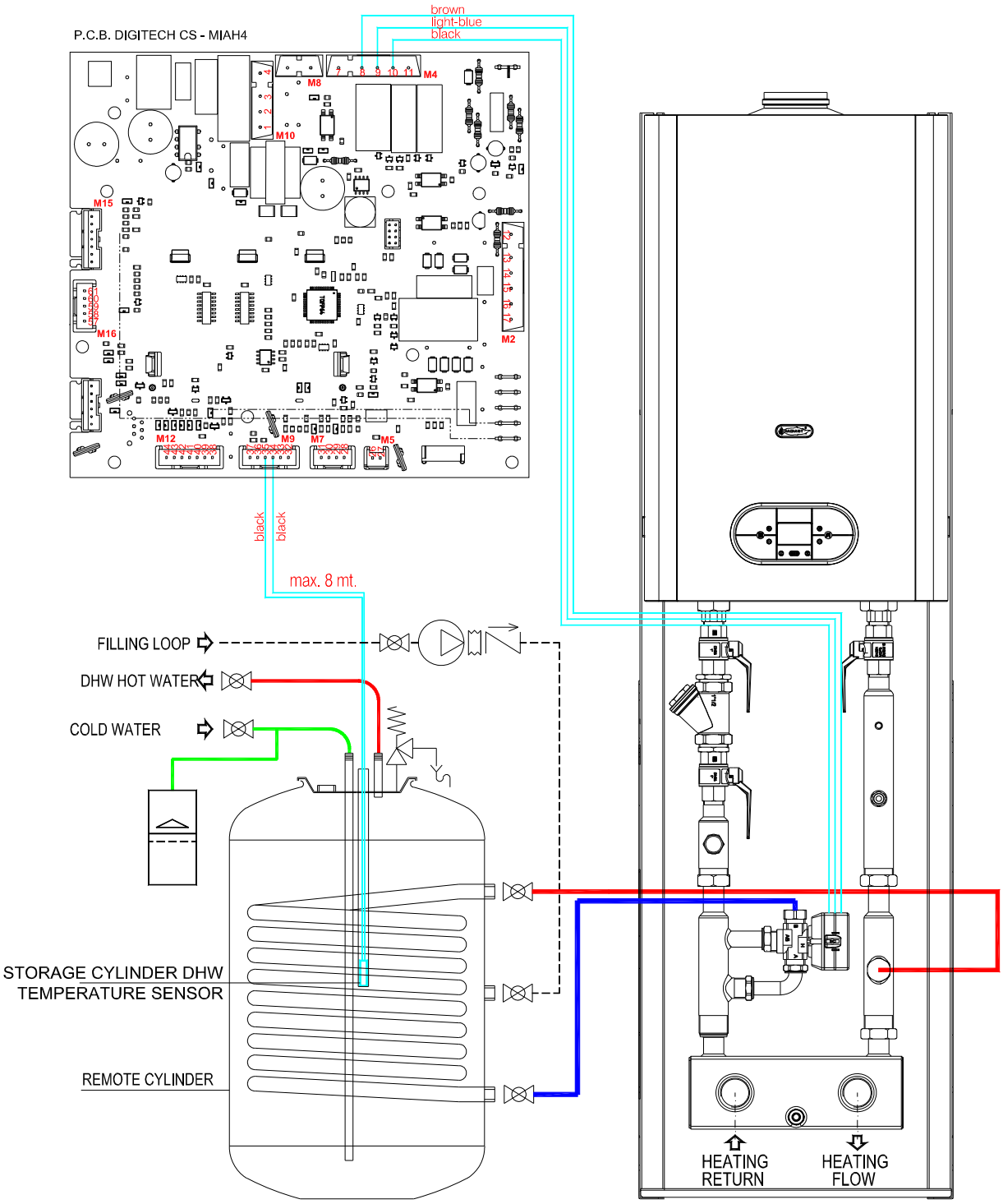


Fig. 1

3.9 Flue connections

3.9.1 General warnings

⚠ **In order to ensure that the appliance functions correctly and efficiently, the flue connection between the boiler and the flue terminal must be made using original components specifically designed for condensing boilers.**

⚠ **The flue connection must be carried out in accordance with relevant standards.**

⚠ **Prior the installation, check and carefully respect the current standards. Respect instructions referring to flue terminals positioning on the wall and/or on the roof, minimum distances from windows, wall, air openings…**

3.9.2 General instructions

- The boiler is a B_{23P} type with a positive pressure connection to a combustion products discharge system which intakes the comburent air from the installation sites.
- Thanks to the air-gas premix, the boiler is indipendent from any flue efficiency loss of flue exhaust and comburent air intake systems. But the maximum flue efficiency loss of the system must not be exceeded to avoid a reduction of the heat output. Checking the air-gas premix will always guarantee on optimal combustion and low polluting emissions.
- **The maximum flue efficiency loss along the boiler flue connections is 146 Pascal.**
- The sub-horizontal parts of flue exhaust kits must always be installed with a slope (3° slope = 5 mm pipe per metre) compared to the boiler installed.
- The boiler must be connected to one of the following flue exhaust systems.
- Flue ducts and chimney must be properly dimensioned, planned and produced in compliance with relevant standards. Their material must be suitable to the final aim with particular resistance to the corrosion, internally smooth and hermetic sealed. Particularly, joints must be condensate tight. To avoid that the condensate produced inside the flue hood flows into the boiler, proper drain points connected to a condensate trap must be previewed.

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3.9.3 Flue kit systems

3.9.3.1 Flue type - KIT EK 100 – cod. 82278LA

Horizontal flue kit Ø100 mm in polypropylene

Discharges exhaust fumes and draws air from atmosphere.

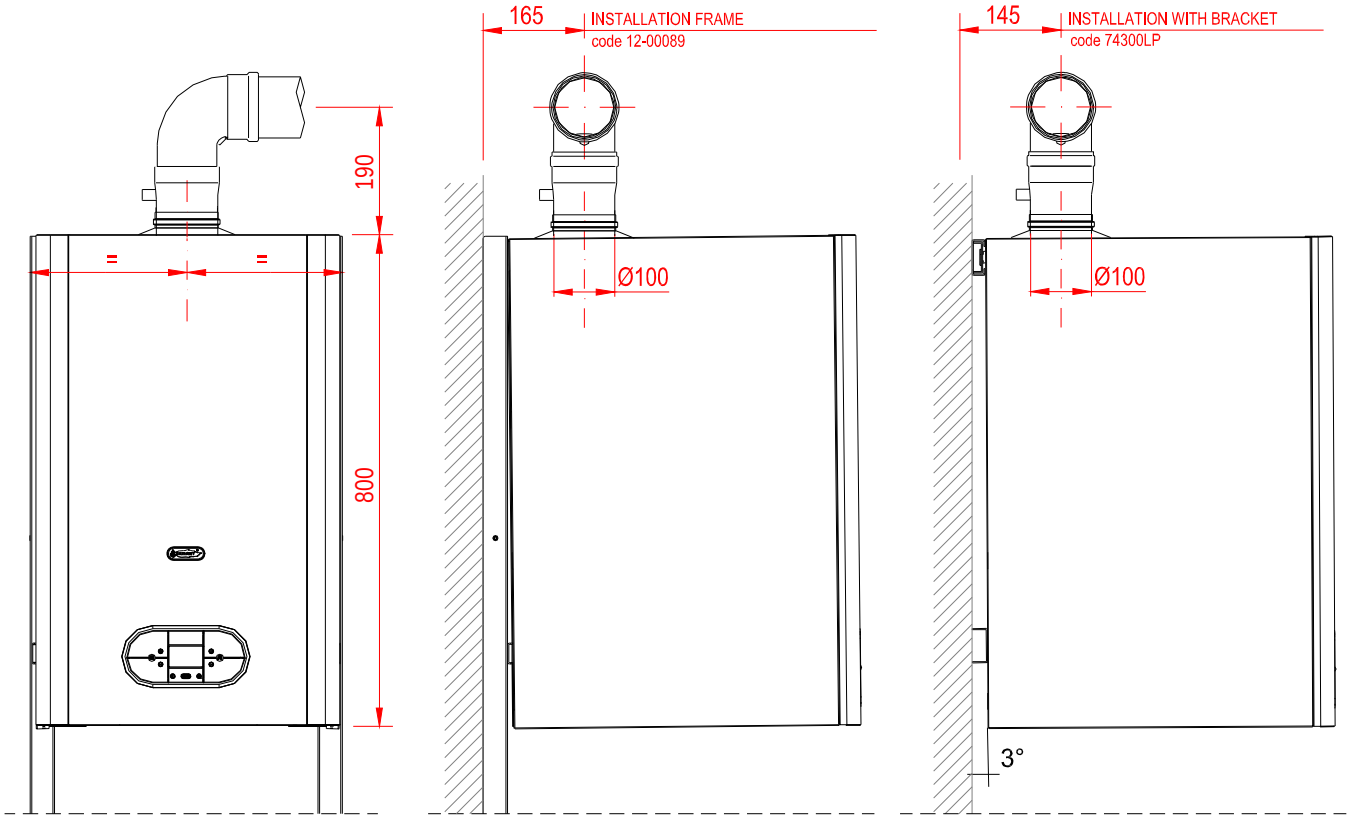


Fig. 1

MAXIMUM FLUE LENGTH

The maximum flue length (linear equivalent) is obtained:

- **a.** Through the sum of individual components flue lengths (linear equivalent) that must be lower than 20 m;
  N.B. A 40 mt maximum flue length can be reached by setting the parameters' value to 180 Hz. Operate according to the instructions of "5.3 Setting the parameters" to modify the parameters' value.
- **b.** Through the sum of individual components' flue efficiency losses, that must be lower than 146 Pa.

The maximum flue length can be obtained according to the following table:

Description	**Equivalent lenght** m	**Flue efficiency loss** Pa
Extension Ø100 L = 1000 mm MF polypropylene	1	5.8
Vertical connector Ø100 w/test point MF polypropylene	0.5	2.9
90° Flue bend Ø100 MF polypropylene	3	17.5
45° Flue bend Ø100 MF polypropylene	1.4	7.8

3.9.3.2 Flue type <u>KIT FK 100 – cod. 82280LP</u>

Vertical flue kit Ø100 mm in polypropylene .

Discharges exhaust fumes and draws air directly from high Level.

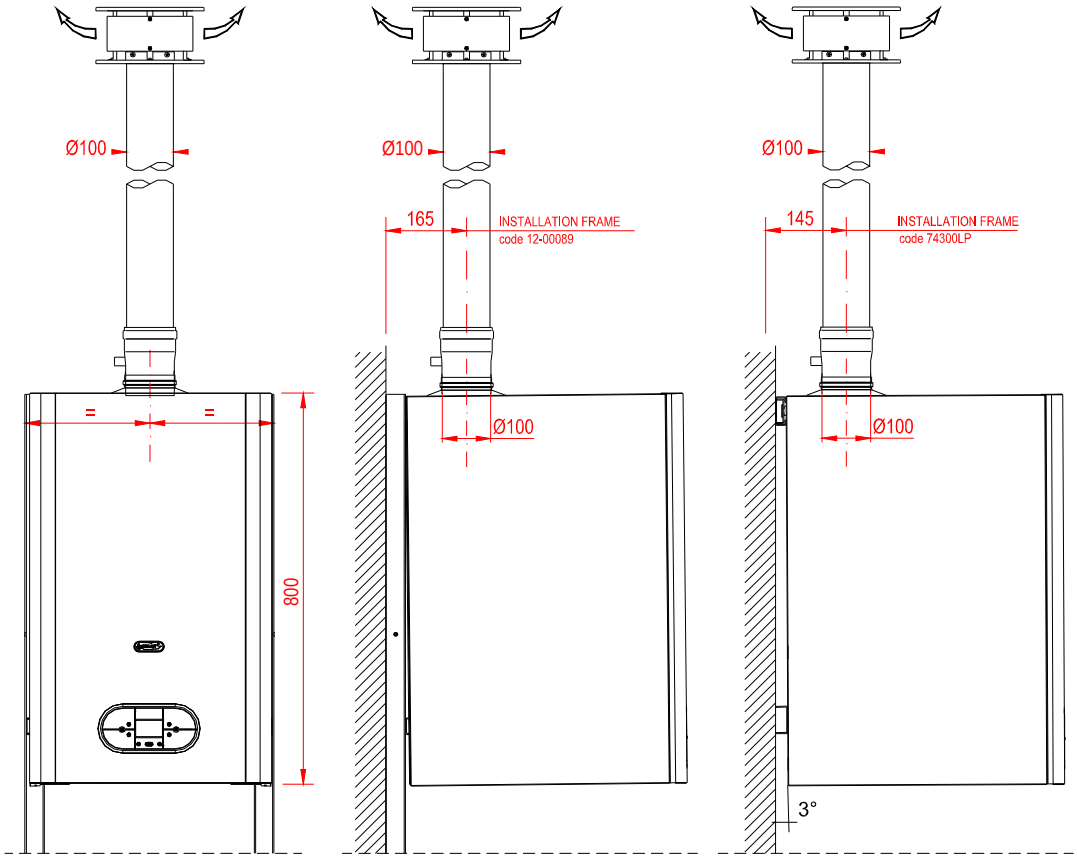


Fig. 1

MAXIMUM FLUE LENGTH

The maximum flue length (linear equivalent) is obtained:

- **a.** Through the sum of individual components flue lengths (linear equivalent) that must be lower than 15 m;
  N.B. A 30 mt maximum flue length can be reached by setting the parameters' value to 180 Hz. Operate according to the instructions of "5.3 Setting the parameters" to modify the parameters' value.
- **b.** Through the sum of individual components' flue efficiency losses, that must be lower than 146 Pa.

The maximum flue length can be obtained according to the following table:

Description	**Equivalent lenght** m	**Flue efficiency loss** Pa
Extension Ø100 L = 1000 mm MF polypropylene	1	5.8
Vertical connector Ø100 w/test point MF polypropylene	0.5	2.9
90° Flue bend Ø100 MF polypropylene	3	17.5
45° Flue bend Ø100 MF polypropylene	1.4	7.8

4. COMMISSIONING THE APPLIANCE

4.1 General warnings

⚠ **The following operations must be carried out by professionally qualified personnel, registered in accordance with current legislation and authorised by Radiant Bruciatori s.p.a.**

⚠ **The boiler leaves the factory pre-set and tested for burning natural Gas. Nevertheless, when starting the boiler for the first time, make sure that the information on the rating plate corresponds to the type of gas being supplied to the boiler.**

⚠ **It is recommended that the system is hot-flushed to remove any impurities (especially oil and grease) that might compromise the proper working operation of the heating unit, from the pipes and radiators.**

⚠ **Once the system has been filled and the necessary adjustments made, remember to tighten the screws of the gas valve test point and make sure that there are no gas leaks from the test point and from any pipe fittings upstream of the gas valve.**

4.2 Preliminary operations

Switching the boiler on for the first time means checking that the installation, regulation and operation of the appliance are correct:

- If the gas supply system is newly installed, then the air present in the pipes can cause the boiler not to light at the first attempt. A number of attempts may be required in order to light the boiler;
- Check that the data on the data plate corresponds to that of the mains supply networks (gas, electricity, water);
- Check that the power supply voltage to the boiler complies with the data plate (230 V – 50 Hz) and that the live, neutral and earth wires are connected properly. Also make sure that the earth connection is sound;
- Check the seals on the gas supply pipe from the mains, and make sure that the meter does not register any flow of gas;
- Open the gas feed valve and make sure that there are no gas leaks from pipe fittings upstream of the boiler (the burner's gas connection must be checked with boiler in function);
- Check that the gas supply is correctly sized for the flow rate required by the boiler and that it is fitted with all the safety and control devices as lay down by current regulations;
- Check that the supply of combustion air and exhaust and condensate discharge systems are functioning correctly and in line with current law and national and local standards;
- Check for the presence of permanent aeration/ventilation openings as required by current law for the type of appliances installed;
- Check that the flue duct and its connections to the terminal/chimney comply with the requirements of current law and national and local standards for the type of appliances installed;
- Make sure that any central heating shut-off valves are open;
- Check that the boiler is sloped of 3°/4° toward the back side. Check that the condensate drain system, including outside the boiler (flue system condensate collection devices), allows the condensate to flow freely to the collection devices. If the condensate is discharged to the domestic drainage system, install an inspection trap in the condensate system prior to it entering the drainage system to interrupt the continuity between the two systems;
- Check that there are no exhaust fumes discharged into the system itself;
- Check that there are no flammable materials or liquids in the immediate vicinity of the boiler;
- Check that circulating pumps freely rotate. Unscrew the inspection screw and verify with a flat screwdriver that the impeller works without obstructions. Prior to loosen or remove the circulating pump cap, protect the electrical devices below from possible leaks of water.

4.3 Filling the system

4.3.1 General warnings

⚠ **Check the properties of the water supply and install the appropriate treatment devices if the mains water has a hardness rating more than 15°F** in **order to prevent scaling and eventual damage to the D.H.W heat exchanger.**

⚠ **Use only clean tap water to fill the system.**
If the system is filled with frost protection chemical agents, the installation of a hydraulic compensator is necessary to separate the central heating circuit from the domestic hot water circuit.

Once the water pipes have been connected, **Before switching the power supply ON,** close the gas feed valve and fill the system as follows:

- Check that the circulating pump runs freely;
- Check that the plug of the air vent valve has been slackened slightly to allow air to escape from the system;
- Close the draining tap and open the external filling loop valve. Use a pressure gauge to check that the system pressure reaches 1.2 ÷ 1.5 bar.
- **make sure that** the external filling loop valve **is perfectly closed.**
- Unscrew the plug on the pump to remove any trapped air, check that the pump is free then re-tighten it when water starts to flow out.
- Open the air vents on the radiators and monitor the air evacuation process. When water starts to flow out of the radiators, close the air vents.
- If, after the above operations, there is a pressure reduction, re-open the external filling loop valve until the pressure gauge reaches 1.2 ÷ 1.5 bar.
- **On completion, make sure that the filling loop is turned off**;

4.3.2 System water features

To ensure that the appliance functions correctly, the following fundamental rules must be observed:

1. make sure that the system doesn't present any leaks and that the bigger ones or the most evident are removed;
2. In presence of an automatic filling system, a liter counter must be installed to know precisely the leaks entity.
3. Softened water must be used to fill up the system in order to reduce the total hardness. The water must be also conditioned to maintain the pH value within the standard limit to avoid corrosion phenomena.
4. In case of new boilers or boiler replacement, the system must be equipped of efficient devices which provide the boiler against air and impurities: Y filters, micro impurities and micro air-bubbles' separators;
5. Make sure that the system water is not discharged during the current maintenance operations even if quantities are apparently insignificant: for example the system must be equipped with apposite shut-off valves for the filters' cleaning.
6. Prior to connect a new boiler to the system, always proceed with the system water analysis to check if water parameters indicate the necessity to drain the system, to use the water already present in the system or to proceed with a chemical system flushing by using the running water with the addition of a detergent in case the system is particularly dirty or obstructed, and to consequently fill up the system with new treated water.

Water treatment

In order to preserve the primary heat exchanger's integrity and always guarantee optimal thermal exchanges, the mains supply water to the primary circuit, circulating inside the condensing boiler heat exchanger, must present long-term definite and constant features.Following preparation and maintenance operations, in compliance with the current standard UNI-CTI 8065, are fundamental:

• flushing up the system;
• check the system water features;

The choice of the water treatment type must be made according to the water features, the system type and the pureness limit requested.

Oxygen

A certain quantity of Oxygen always enters in the system, both in the phase of filling and during the system use, in case of water recovery or in presence of hydraulic components without barriers to the oxygen. Oxygen by reacting with the steel creates corrosion and muds formation. While the primary heat exchanger is made of stainless steel, which is not subjected to corrosion, muds created inside the carbon steel system will deposit in warm parts included the primary heat exchanger. The result will be the reduction of the boiler capacity and the obstruction of the primary heat exchanger's active parts by provoking damages to the boiler.

Precautions to limit this phenomenon are:

- Mechanical systems: a combined air vent and a deslimer correclty installed reduce the Oxygen quantity circulating in the system.
- Chemical systems: additives allow the Oxygen to remain dissolved in the water.

Hardness

The hardness of the filling or recovery water brings a certain quantity of calcium in the system. Calcium adheres on warm parts included the primary heat exchanger. The result is the reduction of the boiler capacity and the obstruction of the primary heat exchanger's active parts by provoking damages to the boiler.

In case the filling or recovery water of the system is not within the values reported here below, it must be sweetened. Additional additives can be used to keep Calcium in solution. The water hardness must be controlled and registered regularly.

Acidity	6,6 < pH < 8,5	
Conductivity	< 400	µS/cm (a 25°C)
Chlorides	< 125	mg/l
Iron	< 0,5	mg/l
Copper	< 0,1	mg/l

A chemical treatment is necessary if the limit of values above is exceeded.

The choice of the water treatment type must be made according to the water features, the system type and the pureness limit requested.

4.4 Filling the condensate trap

The condensation trap must be pre-filled when starting the boiler for the first time in order to prevent flue gases from flowing back through the trap.

The filling operation is carried out as follows (fig. 1 previous page):

- Remove plug **T** and fill the trap **S** three quarters full with water.
- Replace plug **T** and connect the drainpipe **P.**

Note: *It is advisable, after the first few months of operation, to clean the condensate trap from deposits resulting from the first passage of condensate within the technical components of the boiler. Such deposits may cause the malfunction of the siphon.*

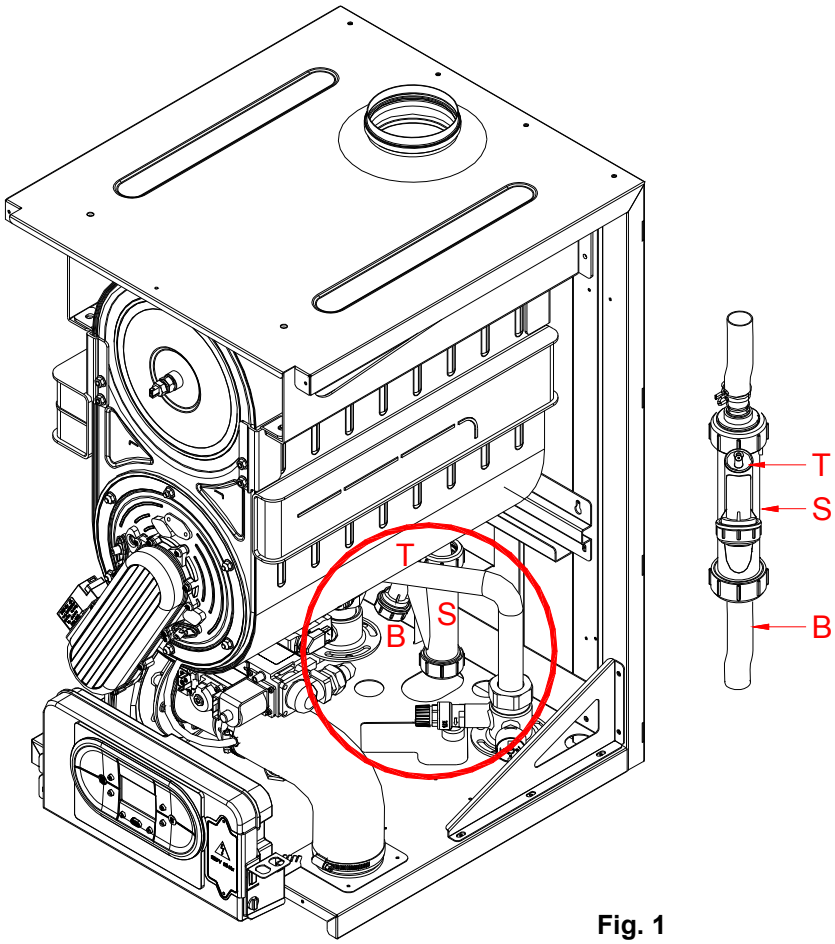


Fig. 1

4.5 Frost Protection

4.5.1 General warnings

The boiler is protected from freezing by electronic board settings and special functions that provide the starting of the burner to heat all the interested parts, when their temperature drops below the minimum preset values, protecting the boiler up to an external temperature of -10°C.

The device operates as follows:

- The heating circuit water temperature drops below 5 °C, the burner is automatically switched ON until the water reaches a temperature of 30°C.
- The domestic hot water temperature drops below 4°, the burner is automatically switched ON until the water reaches a temperature of 8°C.

⚠ ***The system operates even if the boiler is in OFF mode, as long as it is electrically powered (230 V) and the gas supply is open.***

⚠ ***In case of long periods of inactivity, it is recommended to empty the boiler and the hydraulic system.***

Warning for the service technician

In case of a boiler locked out because of freezing, before putting it into operation, make sure that any part is blocked by ice (heat exchanger, pump, etc.).

Warning for the installer

In case of an outdoor boiler installation, where temperatures can drop below -10°C, it is recommended to fill the hydraulic system with an antifreeze inhibitor (see below Table for the dilution percentage) and to install a Heating elements kit (code 82259LP).

Table

Antifreeze	**Temperature**	
Ethylene glycol (%) volume	freezing point (°C)	boiling point (°C)
10	- 4	101
20	- 10	102
30	- 17	104
40	- 27	106
50	- 40	109
60	- 47	114
Recommended Glycol 20% percentage for temperatures up to -10°C.		

4.5.2 Heating elements Kit installation and wiring

Please proceed as follows:

a. Switch OFF the power supply at the main switch;
b. Position the 4 resistances onto the heating flow pipe, heating return pipe, (with the exception of the gas pipe).
c. Protect the pipes with isolating material;
d. Connect the thermostat to the heating flow pipe using the supplied clip;
e. Connect the power supply cables to the terminal board located onto the control panel and following the wiring instruction;
f. Secure the cables between them using the supplied clamps.

4.6 Starting up the boiler

Once the system has been filled, proceed as follows:

- Check that the exhaust duct is free from obstructions and correctly connected to the flue exhaust system;
- Switch on the power supply to the boiler;
- **only for the first start-up, the ignition system will automatically start the 'System purging' function. The function code F33 will appear on the display.** When the function is active, the pump circulates but the burner will not start for 5 minutes. The starting of the boiler is enabled only once the purging cycle has been completed.
- Open the gas feed valve;
- Use button to select the WINTER mode. The symbol will light up (fixed light) to indicate the selected operation mode.
- In case of RS version with remote storage cylinder, use button to select WINTER-SUMMER mode. The symbol will light up (fixed light) to indicate the selected operation mode.
- The automatic ignition system will then light the burner.
- In case of flame failure, the ignition system repeats the ignition procedure after the fan-overrun cycle (20 sec). It may be necessary to repeat the operation in order to remove all the air from the pipes. To repeat the operation, wait approximately 5 seconds from the last ignition attempt before resetting the error code **E01** (pressing the reset button ' ® ').
- With the boiler ignited, if the system still emits noises, the operations must be repeated until all the air has been removed;
- Check the pressure in the system. If the pressure has fallen, re-open the filling tap until the pressure gauge reads 1.2 ÷ 1.5 bar on completion, close the filling tap.
- Unscrew the aluminium plug and insert an analyser in the exhaust sampling point **PF** (see fig. 1) to check the CO2 value. Make sure that the value complies with that reported in table 1;
- If the CO2 value does not correspond to the specified value, carry out adjustment as provided in paragraph "*5.5.1 – Max. power supply regulation - CO_2 value" ;*

Table n°1

Gas type	CO_2 %
G20	9,4

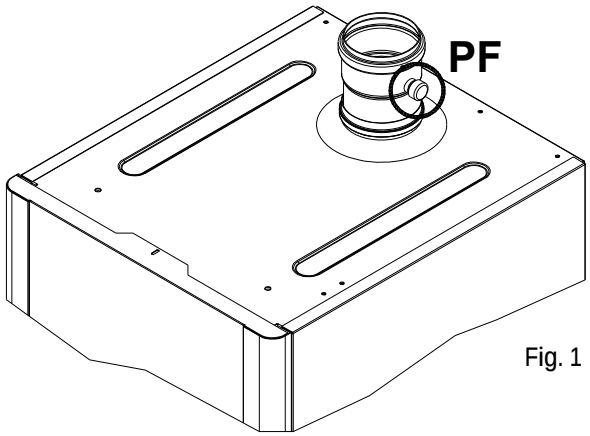


Fig. 1

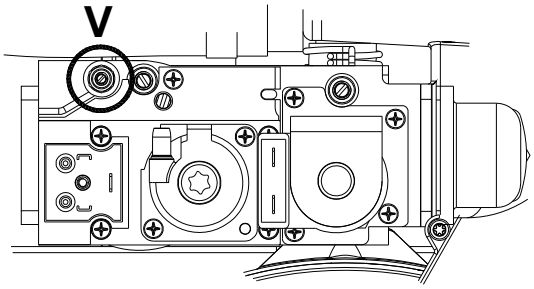


Fig. 2

5. REGULATING THE APPLIANCE

5.1 Parameters table

PARAMETER N°	TYPE OF OPERATION	PARAMETER VALUE	FUNCTION
P00	Selects the model of boiler	00-06	00 = 13 kW 01 = 18 KW 02 = 25 kW 03 = 28 kW 04 = 34 kW 05 = 55 kW **06 = 100 kW**
P01	Selects the type of boiler	00-05	00 = Istantaneous boiler (w/dual circuit exchanger) 01 = Istantaneous boiler (w/secondary D.H.W. plate exch.) 02 = Storage cylinder boiler 03 = Boiler with Comfort storage cylinder 04 = Comfort istantaneous boiler (w/sec. D.H.W. plate exch.) **05 = Only heating boiler**
P02	Selects the type of gas supply	00 01 02	**Natural gas** LPG G25
P03	Sets the central heating temperature	00 01	Standard (30-80 °C) Reduced (25-45 °C)
P04	Heating output rising time	00-04	00 = 0 seconds (Disabled) **01 = 50 seconds (Default)** 02 = 100 seconds 03 = 200 seconds 04 = 400 seconds
P05	Water hammer prevention function	00 01	Off On
P06	D.H.W priority function *(RS version only - with connection to a remote storage cylinder)*	00 01	Off On
P07	Central heating timer	00 - 90	Displayed in multiples of 5 seconds (default value 36 x 5 = 180”)
P08	Central heating pump overrun timer	00 - 90	Displayed in multiples of 5 seconds (default value 36 x 5 = 180”)
P09	D.H.W/Storage cylinder pump overrun timer *(RS version only - with connection to a remote storage cylinder)*	00 - 90	Displayed in multiples of 5 seconds (default value 18 x 5 = 90”)
P10	Sets the minimum fan speed	33 - P11	Displayed in hertz (1Hz = 30 rpm)
P11	Sets the maximum fan speed	P10 - 203	Displayed in hertz (1Hz = 30 rpm)

PARAMETER N°	TYPE OF OPERATION	PARAMETER VALUE	FUNCTION
P12	Sets the minimum fan speed (central heating)	33 - P13	Displayed in hertz (1Hz = 30 rpm)
P13	Sets the maximum fan speed (central heating)	P12 - 203	Displayed in hertz (1Hz = 30 rpm)
P14	Sets the ignition sequence	33 - 203	Displayed in hertz (1Hz = 30 rpm)
P15	Legionella prevention function *(RS version only - with connection to a remote storage cylinder)*	00 01	Off On
P16	Sets the climatic compensation curve *(w/outdoor temperature sensor only installation)*	00-30	See the graph in the parameter setting explanation
P17	Sets the temperature measurement unit	00 01	**°C** °F
P18	Sets the 0-10V industrial bus piloting	00-02	**00 = Disabled** 01 = Flow temperature control mode 02 = Burner output control mode
P19	Central heating minimum set point	20 - 40	Displayed in °C
P20	Central heating maximum set point	40 - 90	Displayed in °C
P21	D.H.W maximum set point *(RS version only - with connection to a remote storage cylinder)*	45 - 75	Displayed in °C
P22	ΔT set point T° flow / T° return *(w/modulating pump and return temperature sensor connected only)*	00 10 - 40	00 = Disabled Displayed in °C
P23	Modulating pump minimum speed *(w/modulating pump and return temperature sensor connected only)*	50 - 70	Displayed in percentage
P24	Modulating pump maximum speed *(w/modulating pump and return temperature sensor connected only)*	70 - 100	Displayed in percentage
P25	ΔT timing T° flow / T° return *(w/modulating pump and return temperature sensor connected only)*	20 - 100	Displayed in seconds

NOTES:

P01 “05” default value for only heating boiler - R version; “02” value for only heating boiler + connections to a remote storage cylinder - RS version;

P04 This parameter allows to modify the time the boiler takes (in heating mode) to reach the maximum power set.

P10, P11, P12 These parameters are automatically set according to the output value set in Parameter P00.

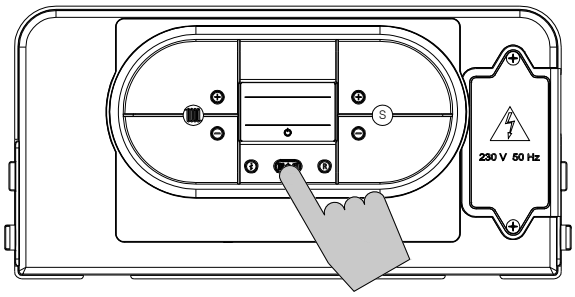
P13 The maximum boiler power, in heating mode, can be set according to the paragraph “5.4.2 Heating Power (kW) – Fan frequency (Hz) diagram **“**

P06, P09, P15, P21 Only for RS version with connection to a remote storage cylinder.

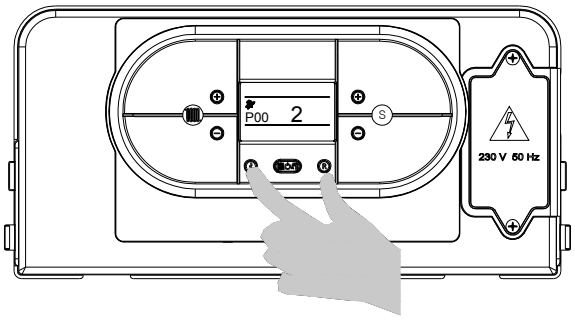
P02 The boiler is NOT approved for LPG (G30 – G31);

5.2 Accessing the parameters menu

To modify the preset values of the parameters reported in the previous table, open the parameter settings menu as follows:

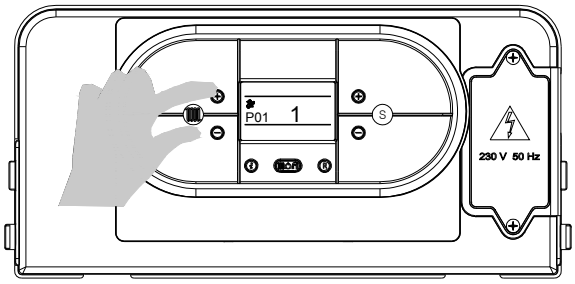


1. Place mode selection button ‘ ’ in OFF position, visualized by ⏻ symbol;



2. Keep pressed ‘ⓘ’ and ‘Ⓡ’ buttons simultaneously and wait for symbol and ‘P00’, to appear on the display.

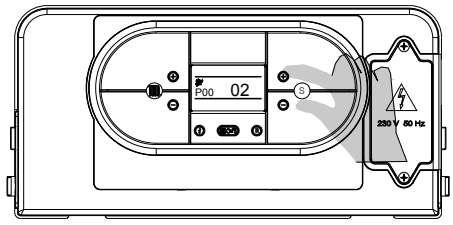
3. Release buttons ‘ⓘ’ and ‘Ⓡ’;

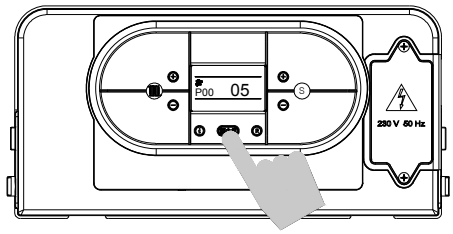


4. Use ‘⊕’ and ‘⊖’ buttons of heating temperature setting to select the parameter to modify;

Adjust the value of the parameter using the procedure described in the following pages.

5.3 Setting the parameters





PARAMETER P00 – SELECTS THE MODEL OF BOILER

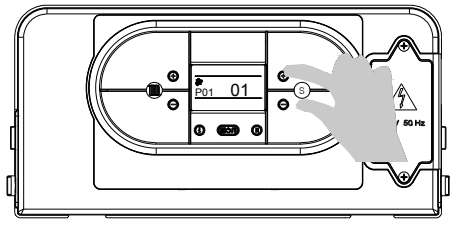
To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

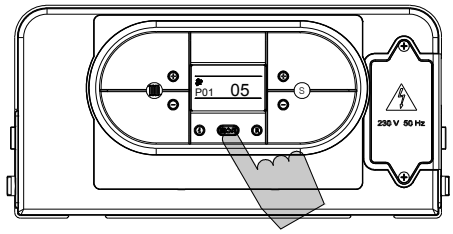
5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter:

00 = 13 kW
01 = 18 KW
02 = 25 kW
03 = 28 kW
04 = 34 kW
05 = 55 kW
06 = 100 kW

6. Press mode selection button '⏻' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P01 – SELECTS THE TYPE OF BOILER

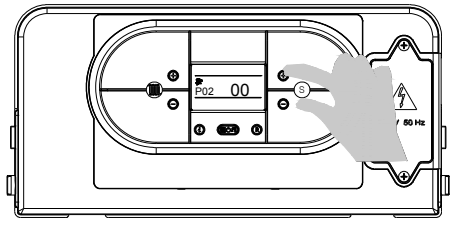
To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

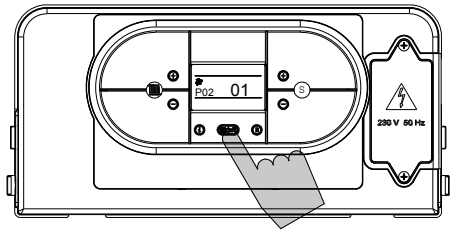
5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter:

00 = instantaneous boiler (w/dual circuit exchanger)
01 = instantaneous boiler (w/secondary D.H.W. plate exchanger)
02 = storage cylinder boiler *(RS version only)*
03 = boiler with Comfort storage cylinder (+7 °C)
04 = Comfort instantaneous boiler (w/secondary D.H.W. plate exchanger and preheating function of plate heat exchanger)
05= only heating boiler

6. Press mode selection button '⏻' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P02 – SELECTS THE TYPE OF GAS SUPPLY

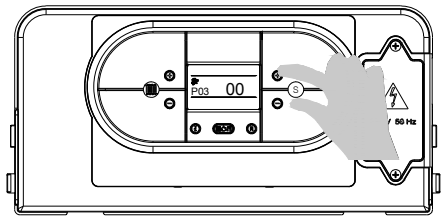
To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

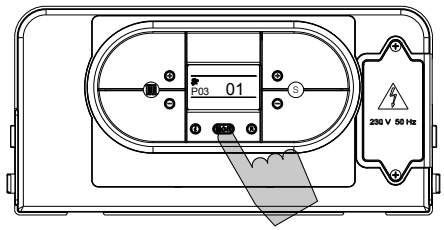
5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter:

00 = Natural Gas
01 = LPG *(NOT approved for LPG)*
02 = G25 *(only foreign)*

6. Press mode selection button '⏻' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P03 – SETS THE CENTRAL HEATING TEMPERATURE

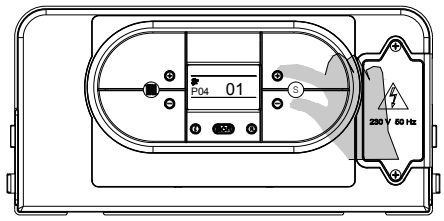
To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

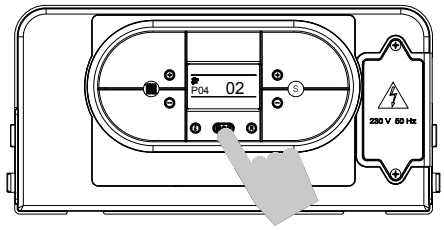
5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter:

00 = standard (30-80°C)
01 = reduced (25-45°C) for under-floor heating

6. Press mode selection button '▦' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P04 – HEATING OUTPUT RISING TIME

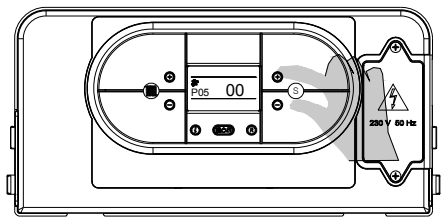
This parameter is used to set the time the boiler takes to reach the maximum power set, during the starting up.
To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

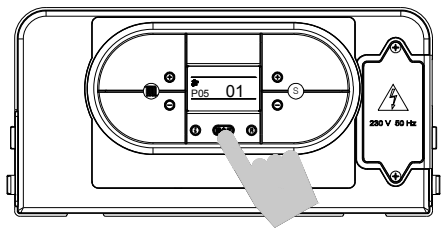
5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter:

00 = 0 seconds (disabled)
01 = 50 seconds (default)
02 = 100 seconds
03 = 200 seconds
04 = 400 seconds

6. Press mode selection button '▦' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P05 – WATER HAMMER PREVENTION FUNCTION

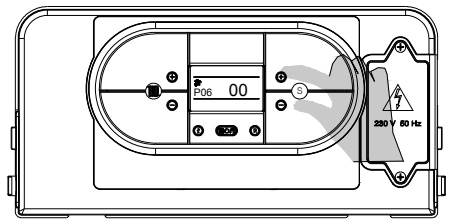
Activating this function, the D.H.W contact is delayed for 2 seconds.
To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

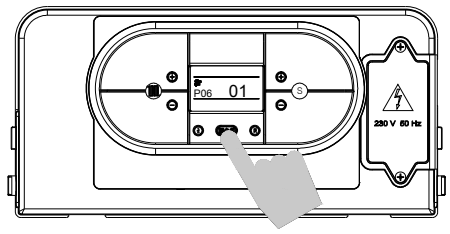
5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter:

00 = Off
01 = On

6. Press mode selection button '▦' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P06 – D.H.W PRIORITY FUNCTION

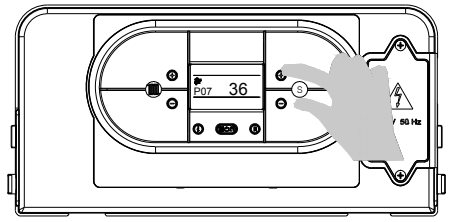
N.B. *RS version only - with connection to a remote storage cylinder*

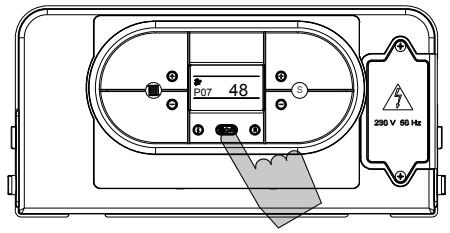
This parameter is used to maintain the diverter valve on D.H.W mode for a time equal to the post-circulation, keeping hot the secondary heat exchanger.
To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter:
00 = Off
01 = On

6. Press mode selection button '⏻' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





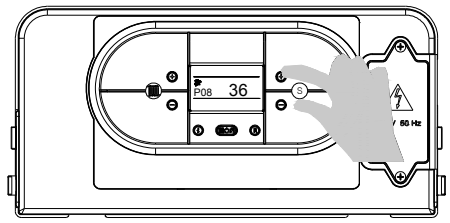
PARAMETER P07 – CENTRAL HEATING TIMER

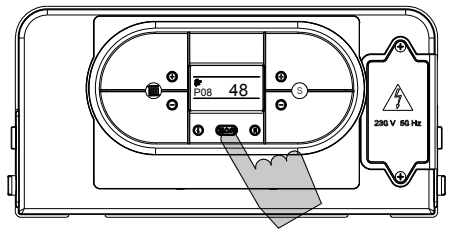
This parameter is used to set the minimum time in which the burner is kept switched off, once the heating flow temperature has exceeded the temperature set by the user.
To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter within the prescribed limits (displayed in multiples of 5 seconds):
min = 00
max = 90
For ex.: 90 = 90 x 5" = 450" (7,5 min)
The default value is 36 = 180" = 3 min

6. Press mode selection button '⏻' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





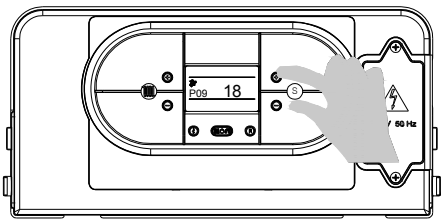
PARAMETER P08 – CENTRAL HEATING PUMP OVERRUN TIMER

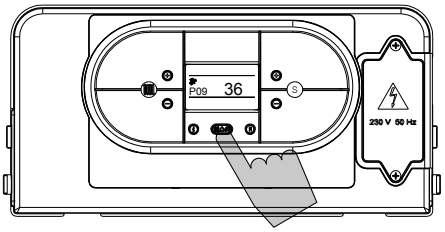
This parameter is used to set the pump functioning time, in heating mode, after switching off the main burner for the intervention of the room thermostat.
To enter the parameters menu, follow the previously described procedure (*see paragraph* ***5.2 'Accessing the parameters menu'*** - steps 1-4).

5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter within the prescribed limits (displayed in multiples of 5 seconds):
min = 00
max = 90
For ex.: 90 = 90 x 5" = 450" (7,5 min)
The default value is 36 = 180" = 3 min

6. Press mode selection button '⏻' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P09 – D.H.W/STORAGE CYLINDER PUMP OVERRUN TIMER

N.B. *RS version only - with connection to a remote storage cylinder*

This parameter is used to set the pump functioning time, in D.H.W mode, after closing the water tap.

To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

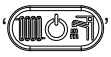
5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter within the prescribed limits (displayed in multiples of 5 seconds):

min = 00

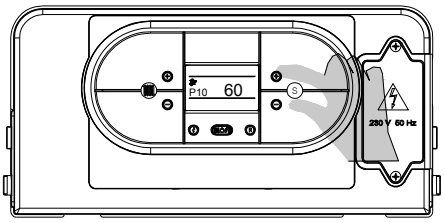
max = 90

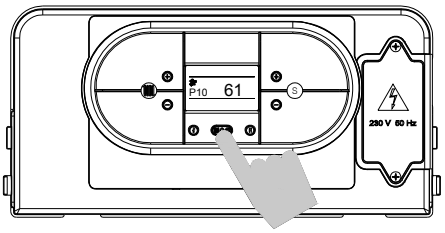
For ex.: 90 = 90 x 5" = 450" (7,5 min)

The default value is 18 = 90" = 1.5 min

6. Press mode selection button '  ' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P10 – SETS THE MINIMUM FAN SPEED

This parameter is used to set the minimum fan speed which corresponds to the minimum burner output.

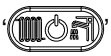
To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter within the prescribed limits (displayed in Hertz):

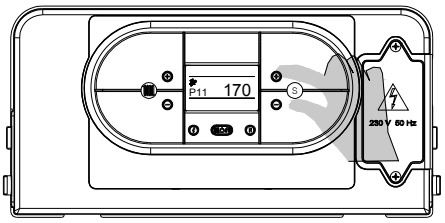
min = 33 Hz

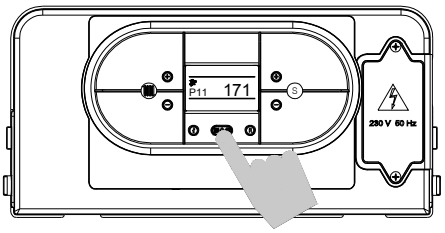
max = Value set in parameter P11

The default value is set according to the output value set in Parameter P00.

6. Press mode selection button '  ' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P11 – SETS THE MAXIMUM FAN SPEED

This parameter is used to set the maximum fan speed which corresponds to the maximum burner output.

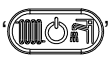
To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter within the prescribed limits (displayed in Hertz):

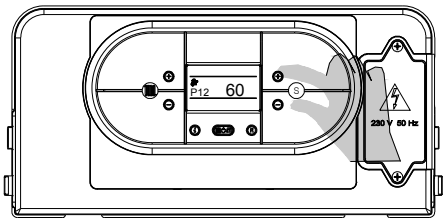
min = Value set in parameter P10

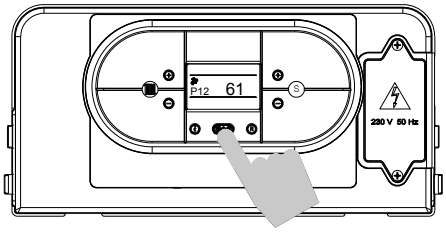
max = 203 Hz

The default value is set according to the output value set in Parameter P00.

6. Press mode selection button '  ' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P12 – SETS THE MINIMUM FAN SPEED (CENTRAL HEATING)

This parameter is used to set the minimum fan speed in heating mode, which corresponds to the minimum burner output during a heating mode request.

To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter within the prescribed limits (displayed in Hertz):

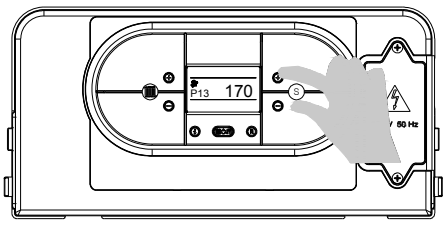
min = 33 Hz

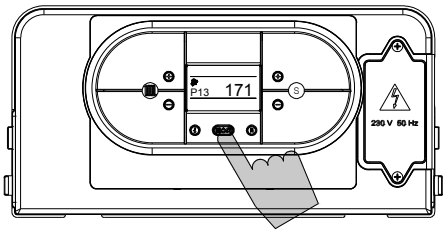
max = Value set in parameter P13

The default value is set according to the output value set in Parameter P00.

6. Press mode selection button '⏻' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P13 – SETS THE MAXIMUM FAN SPEED (CENTRAL HEATING)

This parameter is used to set the maximum fan speed in heating mode, which corresponds to the maximum burner output during a heating mode request [see paragraph 5.5 Heating output (kW) – Fan frequency (Hz) diagram].

To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter within the prescribed limits (displayed in Hertz):

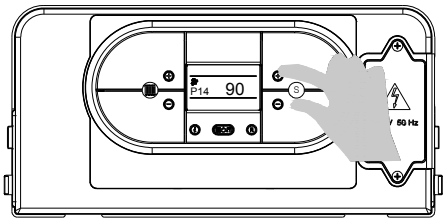
min = Value set in parameter P12

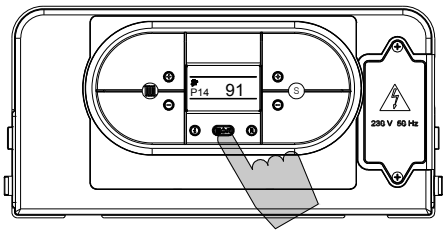
max = 203 Hz

The default value is set according to the output value set in Parameter P00.

6. Press mode selection button '⏻' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P14 – SETS THE IGNITION SEQUENCE

This parameter is used to set the fan speed during the starting up of the boiler.

To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter within the prescribed limits (displayed in Hertz):

min = Value set in parameter P10

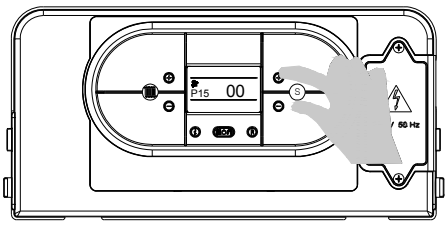
max = 203 Hz

The default value is set according to the output value set in Parameter P00.

6. Press mode selection button '⏻' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.

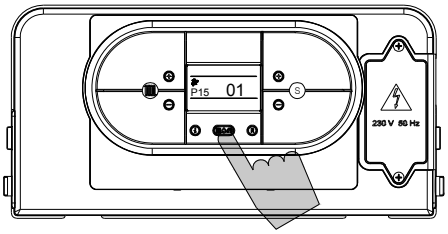
PARAMETER P15 – LEGIONELLA PREVENTION FUNCTION



N.B. *RS version only - with connection to a remote storage cylinder*

To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

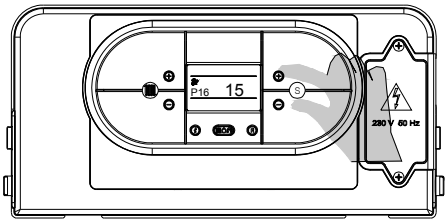
5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter:
00 = Off
01 = On



6. Press mode selection button '⏻' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.

PARAMETER P16 – SETS THE CLIMATIC COMPENSATION CURVE *(w/outdoor temperature sensor only installation)*

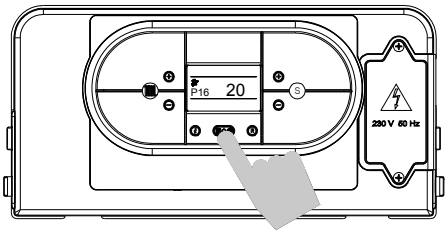


N.B. *With outdoor temperature sensor only*

The installation of an outdoor temperature sensor (*see "6.8 'Electrical connections")* allows to automatically modify the flow temperature in accordance to the outdoor temperature. The factor governing the correction is the **Kd** thermoregulation value, indicating the flow temperature range selected (fig.1).

The selection of the compensation curve is determined by the maximum flow temperature **Tm** and the minimum outdoor temperature **Te** taking into consideration the house insulation degree.

The values of the flow temperature Tm, refer to standard 30-80 °C appliances or 25-45 °C for under-floor heating systems. The type of appliance can be set using parameter P03.



To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4) and select parameter P16.

5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter within the range of setting from 00 to 30.
The value corresponds to the graph curves in figure n.1.

6. Press mode selection button '⏻' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.

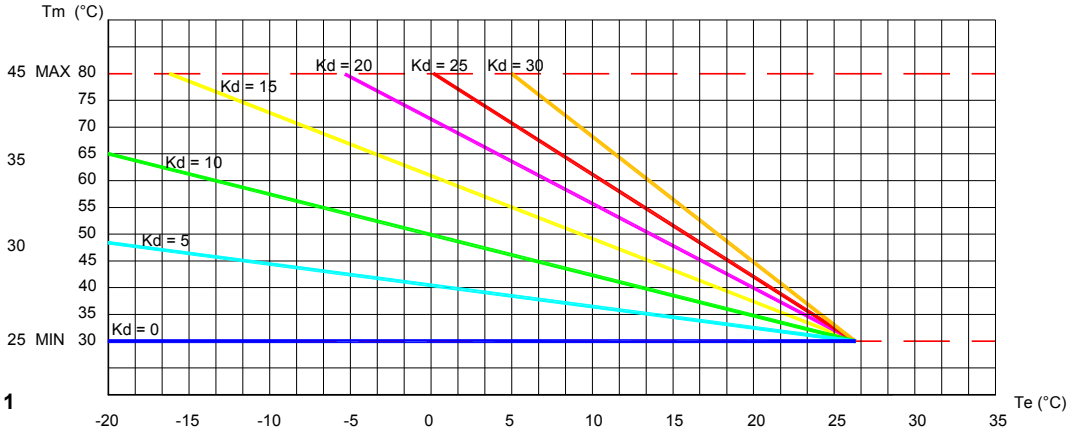
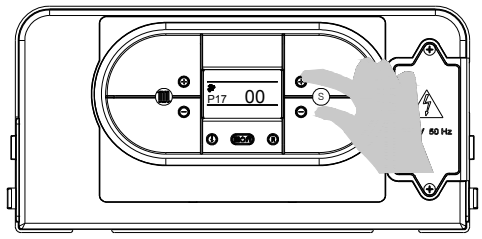
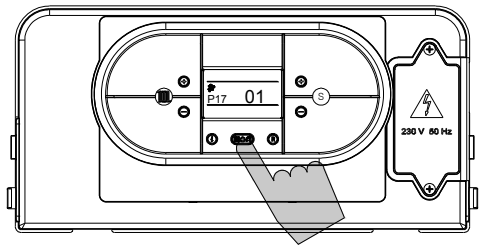


Fig. 1

Note: in the case of simultaneous presence of outdoor temperature sensor and remote control, the electronic board only sends the value of outdoor temperature to the remote device without using it for the modulation. The remote device will use the value for modulation, if necessary. (See the manual of the remote).
The communication between the electronic board and the remote control takes place regardless of the mode of operation selection made in the boiler, and once the connection is established, the onboard user interface is disabled and the display will show the symbol ⟳'





PARAMETER P17 – SETS THE TEMPERATURE MEASUREMENT UNIT

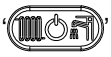
This parameter is used to set the temperature measurement unit displayed: Celsius (°C) or Fahrenheit (°F) degrees.

To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

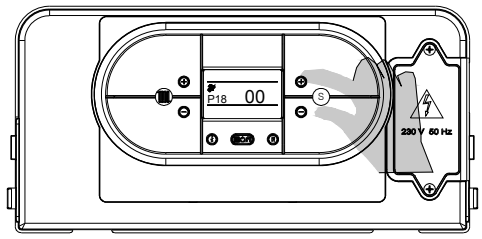
5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter:

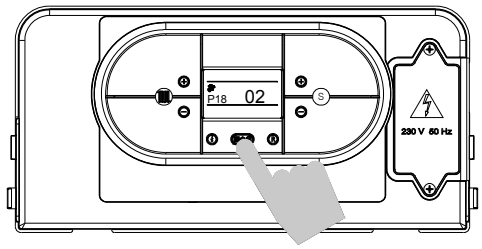
00 = °C

01 = °F

6. Press mode selection button '  ' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P18 – SETS THE 0-10V INDUSTRIAL BUS PILOTING

This parameter is used to enable/disable the 0-10V industrial bus in order to set the burner output and the flow temperature by outdoor bus.

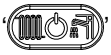
To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter:

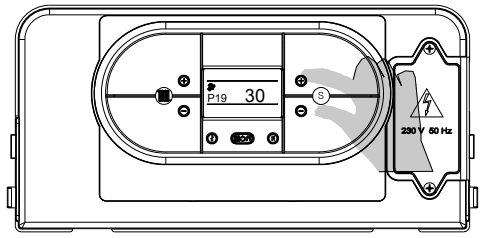
00 = Disabled

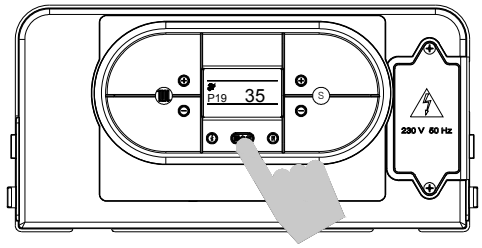
01 = Flow temperature control mode

02 = Burner output control mode

6. Press mode selection button '  ' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P19 – CENTRAL HEATING MINIMUM SET POINT

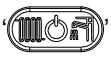
This parameter is used to set the central heating minimum user set point.

To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

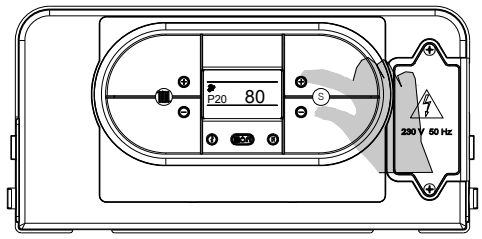
5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter within the prescribed limits (displayed in Celsius degrees):

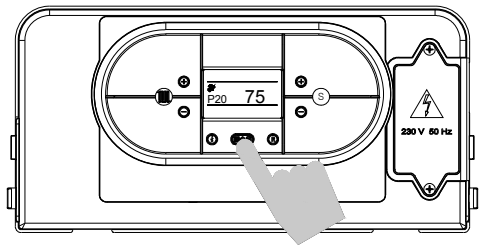
min = 20 °C

max = 40 °C

6. Press mode selection button '  ' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P20 – CENTRAL HEATING MAXIMUM SET POINT

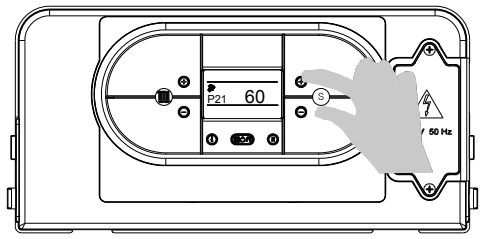
This parameter is used to set the central heating maximum user set point.

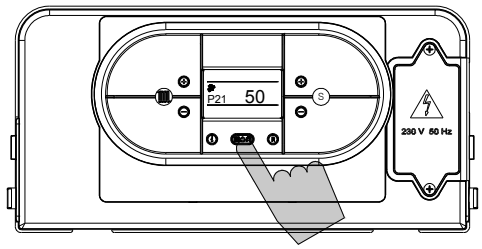
To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter within the prescribed limits (displayed in Celsius degrees):
min = 40 °C
max = 90 °C

6. Press mode selection button '⏻' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P21 – D.H.W. MAXIMUM SET POINT

N.B. *RS version only - with connection to a remote storage cylinder*

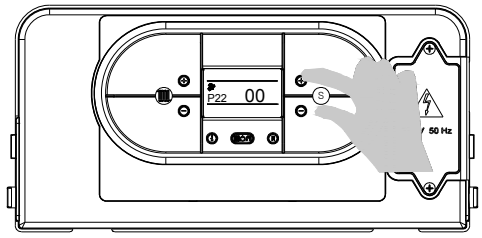
This parameter is used to set the D.H.W maximum user set point.

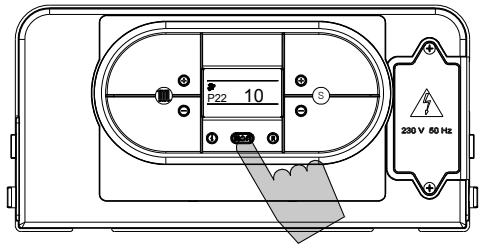
To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter within the prescribed limits (displayed in Celsius degrees):
min = 45 °C
max = 75 °C

6. Press mode selection button '⏻' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P22 – ΔT SET POINT T° FLOW / T° RETURN

N.B. *w/modulating pump and return temperature sensor connected only*

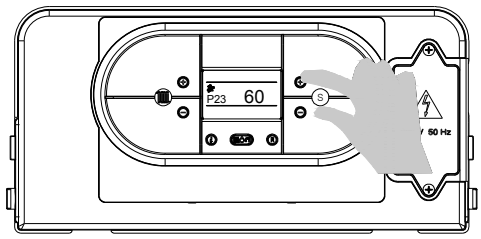
This parameter is used to set the delta value between the flow and the return temperature.

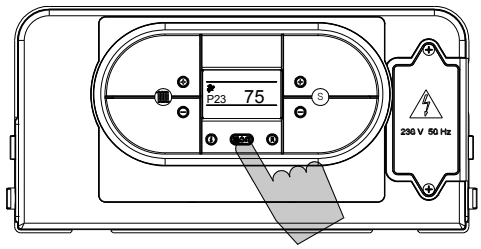
To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter within the prescribed limits (displayed in Celsius degrees):
00 = Disabled
min = 10 °C
max = 40 °C

6. Press mode selection button '⏻' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





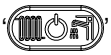
PARAMETER P23 – MODULATING PUMP MINIMUM SPEED

N.B. *w/modulating pump and return temperature sensor connected only*

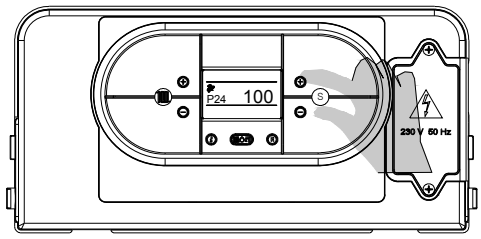
This parameter is used to set the minimum modulating pump speed during a heating mode request.

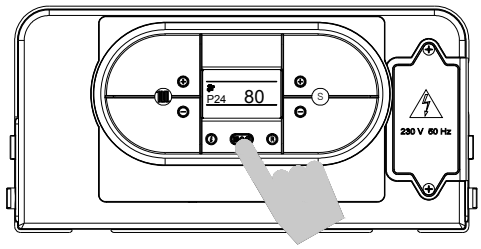
To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter within the prescribed limits (displayed in percentage):
min = 50 %
max = 70 %

6. Press mode selection button '  ' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





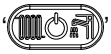
PARAMETER P24 – MODULATING PUMP MAXIMUM SPEED *N.B.*

N.B. *w/modulating pump and return temperature sensor connected only*

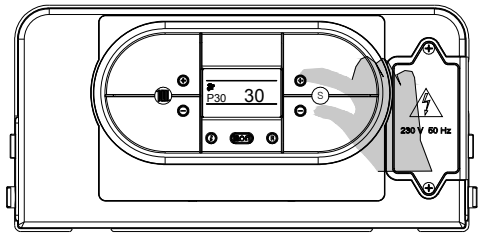
This parameter is used to set the maximum modulating pump speed during a heating mode request.

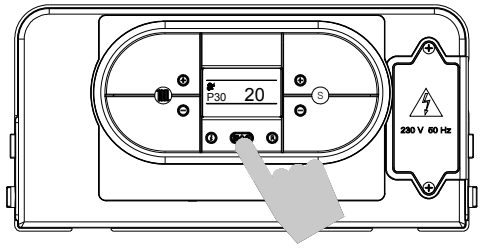
To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter within the prescribed limits (displayed in percentage):
min = 70 %
max = 100 %

6. Press mode selection button '  ' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





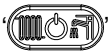
PARAMETER P25 – ΔT TIMING T° FLOW / T° RETURN

N.B. *w/modulating pump and return temperature sensor connected only*

This parameter is used to set the timing response of the modulating pump.

To enter the parameters menu, follow the previously described procedure (*see paragraph 5.2 'Accessing the parameters menu'* - steps 1-4).

5. Use ' ⊕ ' and ' ⊖ ' buttons Ⓢ symbol side to modify the value of the parameter within the prescribed limits (displayed in seconds):
min = 20
max = 100

6. Press mode selection button '  ' to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.

5.4 Gas data

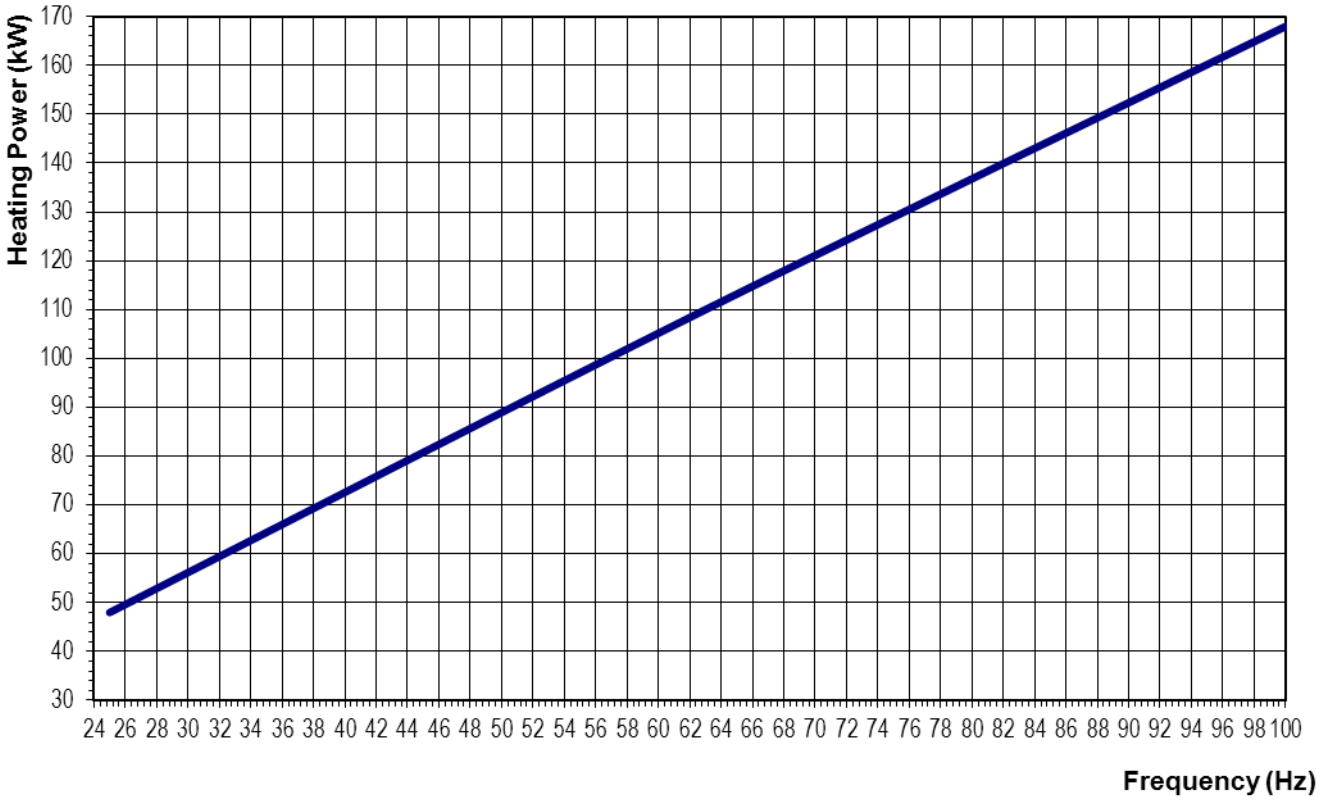
5.4.1 Technical data tables

Table no.1 - CO_2 Values	
Gas type	**CO_2 %**
G 20	9.4

Table no.2 - Frequency		
Gas type	**Minimum (Hz)**	**Maximum (Hz)**
G 20	48	168

Table no.3 - Gas data table		NATURAL GAS G20
Lower Wobbe index (15°C; 1013 mbar)	MJ/Nm^3	45.67
Nominal Supply pressure	mbar	20
Consumption (15°C; 1013 mbar)	m^3/h	10.42

5.4.2 Heating Power (kW) - Fan frequency (Hz) diagram



5.5 Regulating the Gas Valve Offset

table n°1

Tipo gas	CO_2 %
G20	9,4

When replacing the gas valve, it is necessary to regulate the offset on the new gas valve to guarantee a correct operation of the boiler.

N.B. The boiler is only approved for G20 .

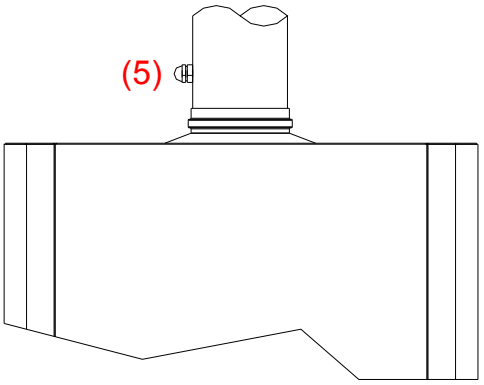


Fig. 1

5.5.1 Max. power supply regulation - CO_2 value

- Switch on the boiler;
- Insert the flue analiser to the inspection point **(5)** (fig. 1) in order to determine the CO_2 value and wait until the boiler operates and the fan runs at the max. speed.
- Check the CO_2 value on the instrument and verify that the value is 9.4. If necessary operate on the screw **(2)** (fig.2) to reduce or increase the CO_2 value (ATTENTION, the screw has not a stop point therefore it rotates by completely opening or closing the gas passage).

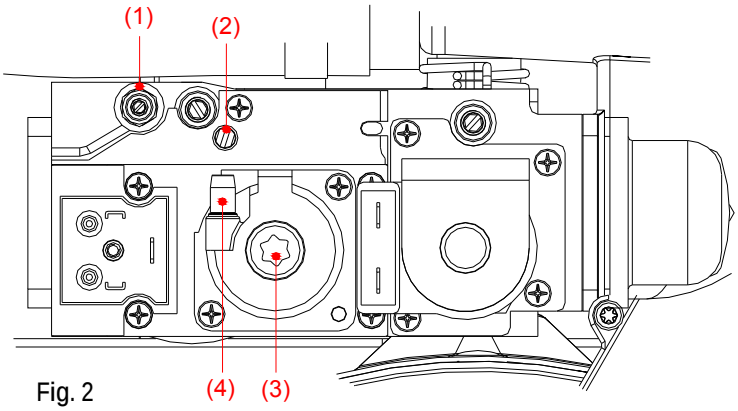


Fig. 2

5.5.2 OFF-SET Regulation

- Make sure that the gas valve **(4)** (fig. 2) and air intake pipe **(6)** (fig. 3) pressure points are connected with a silicon pipe (7);
- Slaken the screw **(1)** and insert a manometer – with a mbar graduate scale;
- Switch on the boiler at the min. capacity (parameter 12);
- The manometer should read a value of -0.07 mbar;
- If it reads a different value, unscrew the cap screw **(3)** (fig. 2) and operate on the internal plastic screw. By rotating it clockwise or anticlockwise the OFF – SET value can be increased or reduced;
- Once the regulation is completed, screw the cap screw **(3)** (fig. 2), remove the manometer and screw the pressure point screw **(1)** (fig. 2);

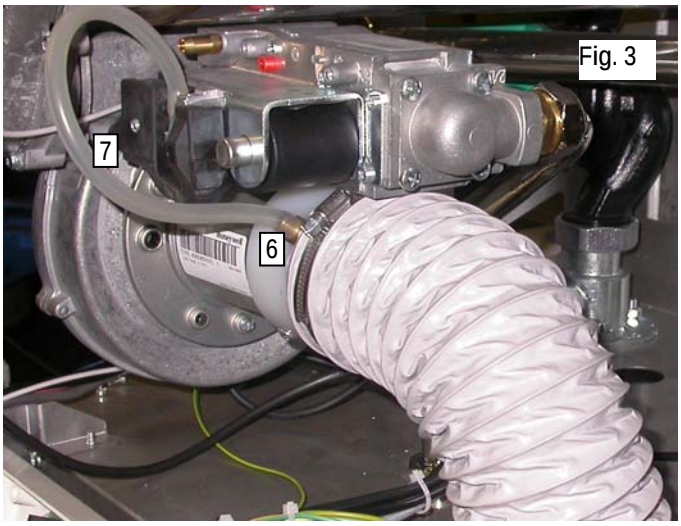


Fig. 3

6. SERVICING THE APPLIANCE

6.1 General Warnings

⚠ **All maintenance operations must be carried out by professionally qualified personnel, authorised by Radiant Bruciatori Spa.**

⚠ **The frequency of boiler maintenance must comply with current law and, nevertheless, should be carried out once a year.**

⚠ **In order to guarantee the long life of the appliance and in accordance with the current gas safety regulations, only use original spare parts**

⚠ **Before carrying out any type of maintenance operation, disconnect the appliance from the mains electricity supply and close the gas valve.**

6.2 Boiler inspection

6.2.1 Main electricity supply

Fluctuations in mains voltage (230 V) of about +10 % -15 % do not bring functioning problems. The main electricity production must be in compliance with the CEI relevant and current standards. The boiler must also be equipped of a safety device able to ensure the mains voltage's multipolar disconnection with an opening distance of the contacts of at least 3 mm.

6.2.2 Periodical checks

In order to ensure that the boiler operates efficiently and safely, it is recommended that the appliance is inspected by a suitably competent technician at least once a year.

The following operations should be carried out annually:

- Check the condition of the gas seals and replace where necessary;
- Check the condition of the water seals and replace where necessary;
- Visually inspect the condition of the combustion chamber and flame;
- When required, check that the combustion is correctly regulated and if necessary proceed in line with section “Commissioning the boiler”;
- Remove and clean any oxidation from the burner;
- Check that any water leaks and/or oxidation on connections is present;
- Check that the seal of the room-sealed chamber is undamaged and positioned correctly;
- Check the primary heat exchanger and clean if necessary;
- Check the condition and operation of the ignition and gas safety systems. If necessary, remove and clean the scaling from the ignition and flame detection electrodes, paying particular attention to replace them at the correct distance from the burner;
- Check the heating safety systems: temperature limit safety thermostat, pressure limit safety device;
- Check the safety valve/s on the heating circuit
- Check the pre-fill pressure of the expansion vessel (see expansion vessel data plate);
- Check and if necessary re-set the correct pressure value of the system;
- Check the correct circulation inside the boiler through filtering devices;
- Check that the boiler is sloped of 3°/4° toward the back side. Check that the condensate drain system, including outside the boiler (flue system condensate collection devices), allows the condensate to flow freely to the collection devices. If the condensate is discharged to the domestic drainage system, install an inspection trap in the condensate system prior to it entering the drainage system to interrupt the continuity between the two systems;

- Check that the permanent air intake/ventilation points are present, correctly dimensioned and functioning compared with the installed devices and that they are in compliance with current local and national standards.
- Periodically check the integrity of the flue exhaust system for the safety and the good functioning of the boiler;
- Check that the connection to the mains electricity supply complies with that reported in the boiler's instruction manual;
- Check the electrical connections inside the control panel;
- Check the condensate trap and that the condensate drain system is working correctly, including any parts of the system outside the boiler such as condensate collection devices along the length of the flue and/or any acid neutralising devices;
- Check that the condensate flows freely and that there are no exhaust fumes present within the appliance.

6.3 Accessing the boiler

All maintenance operations require one or more of the boiler casing panels to be removed.

The side panels can only be removed after the front panel has been removed.

Front panel:

- Remove the fixing screws at the lower edge of the front panel.
- Grasp the panel ② and pull it outwards (fig. 1).

Left and right side panel:

- Remove the fixing screws at the front and lower edge of the side panel to remove.
- Grasp the bottom of the panel, move it sideways and then upwards to remove it ③.

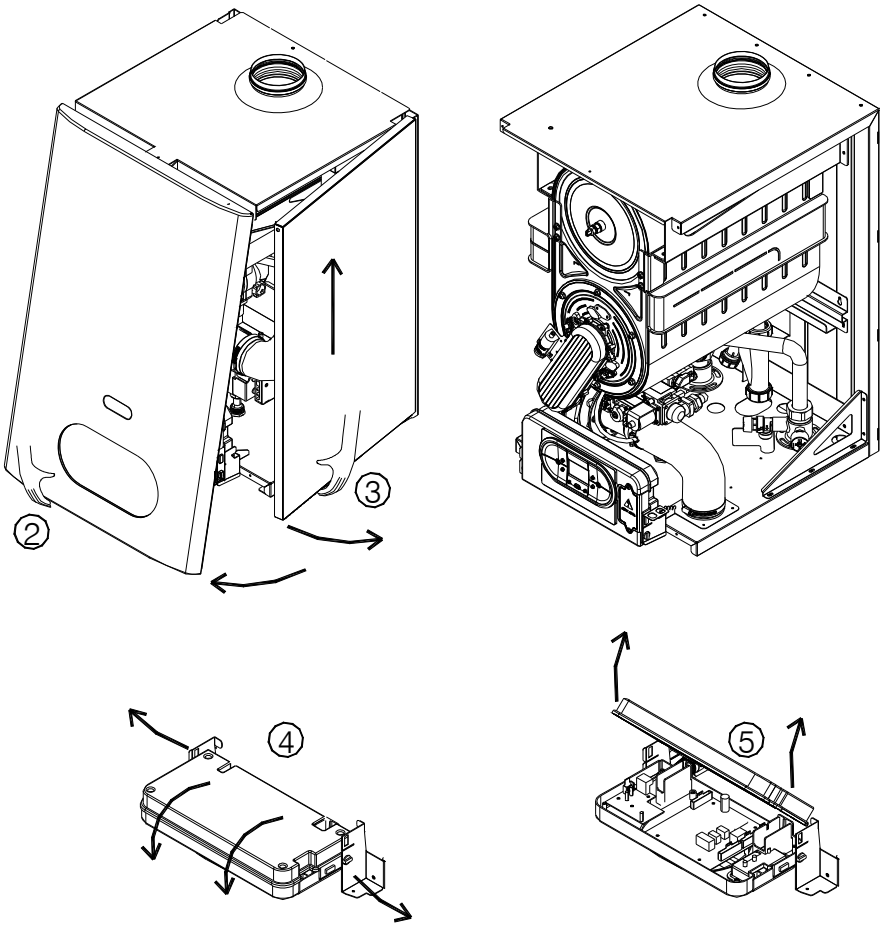


Fig. 1

To access the electrical connections of the control panel, proceed as follows:

- Remove the front panel (see fig. 1).
- Grasp the left and right control panel support brackets ④ and pull them outwards, at the same time rotating the panel downwards.
- Unscrew the four fixing screws ⑤ and remove the cover.

6.4 Draining the central heating system

If the need arises to drain the system, this can be done as follows:

- Switch the system to “WINTER” mode and ignite the boiler.
- Switch off the power supply to the boiler.
- Wait for the boiler to cool down.
- Connect a hosepipe to the system drain point and locate the other end of the hose in a suitable drainage system.
- Open the system drain valve (see fig. 1).
- Open the air vents on the radiators, starting with the highest and moving down the system to the lowest.
- When the system has been drained, close the radiator breather valves and the drain valve.
- **If only the boiler needs to be drained, close the flow/return isolating valves on the heating circuit and open the drain valve located at the bottom of the boiler on the pump manifold (see fig. 1);**

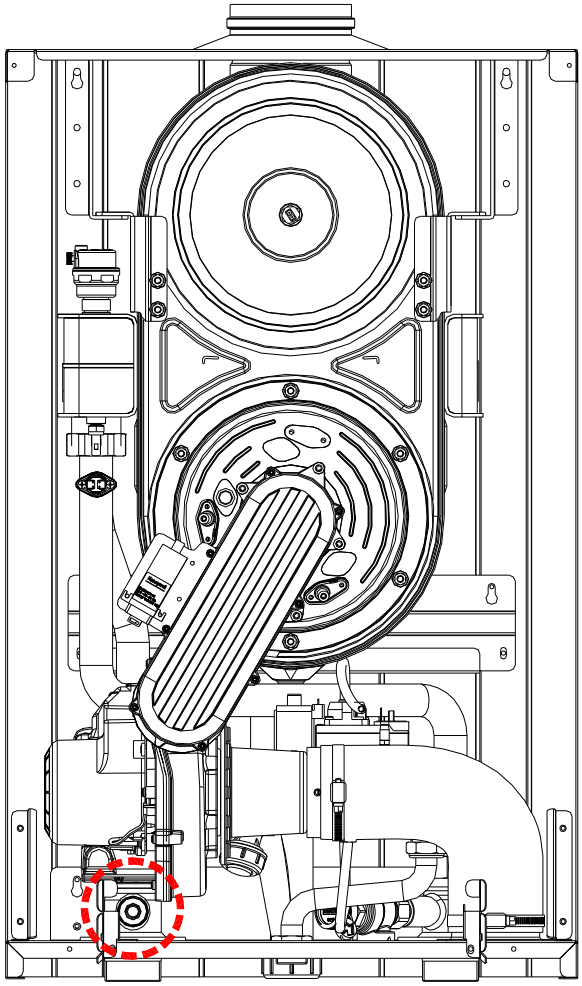


Fig. 1

6.5 Boiler deactivation

When the applicance is no longer required for use, the necessary operation (disconnect the applicance from the main electricity / gas / water supply) must be made by qualified personnel.

6.6 Maintenance operations

⚠ **Before carrying out any cleaning or part replacement operations, ALWAYS turn off the ELECTRICITY, WATER and GAS supplies to the boiler.**

The Manufacturer will not be held responsible for damage to any of the boiler's components caused by non-compliance with this instruction.

For all maintenance operations requiring removal of the boiler casing, refer to the procedures described in paragraph *6.3 "Accessing the boiler"*.

6.6.1 Cleaning the main exchanger module and combustion unit

- Switch off the power and gas supplies to the boiler;
- Disconnect the electrical connections of the electric fan;
- Disconnect the joint and remove the pipe linking the gas valve to the injector unit;
- Un-plug the ignition electrode and flame detection wires from the ignition control unit;
- Remove the transformer and the fixing plate;
- Unscrew the fixing screws and remove from the venturi manifold, the air intake pipe;
- Remove the flue exhaust connection and the room-sealed chamber top
- Unscrew the nuts securing the burner unit (consisting of a fan, manifold and burner) to the primary heat exchanger;
- Remove the burner unit, paying particular attention not to remove the ceramic fibre protection from the bottom of the heat exchanger;
- Check that the burner is not affected by deposits, scaling or excessive oxidation. Check that all the holes in the burner are free;
- Clean the electrodes carefully without altering their positions with respect to the burner;
- Clean the burner cylinder using a non-metal brush and without damaging the ceramic fibre;
- Check the integrity of the gasket on the cover of the burner;
- Clean the heat exchanger (fig. 1) using a household detergent for stainless steel, distributing the product on the spirals of the exchanger using a brush. Do not wet the ceramic fibre coating. Wait a few minutes then remove the deposits using a non-metal brush. Then remove the residues under running water;
- Remove the pipe clip, remove the condensate drainpipe and clean under running water;
- Unscrew the joint to the condensate trap, remove the trap and wash under running water;
- With the cleaning completed, re-assemble the components following the above procedure in reverse order;
- Finally, check the boiler to make sure that all gas and exhaust joints are tight.

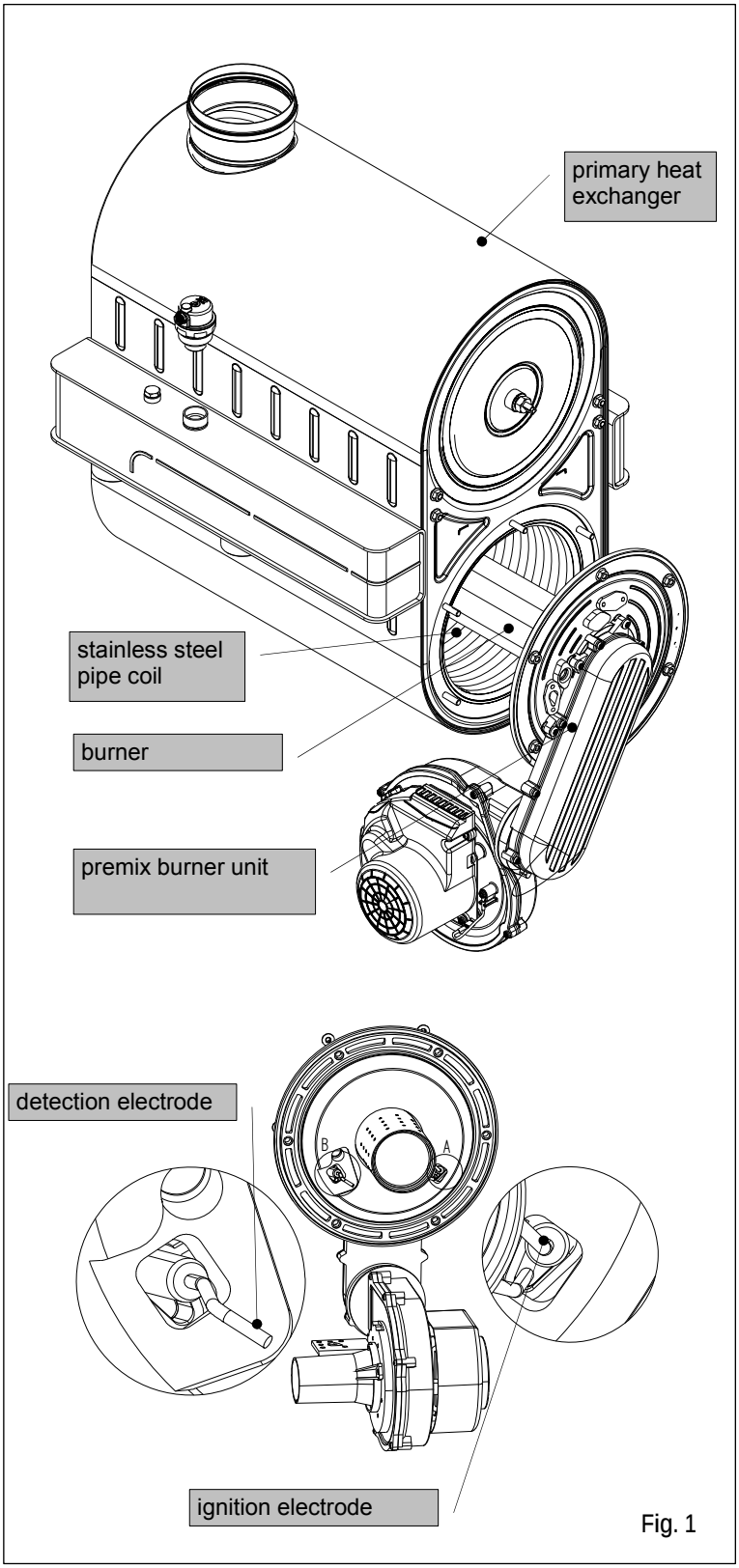
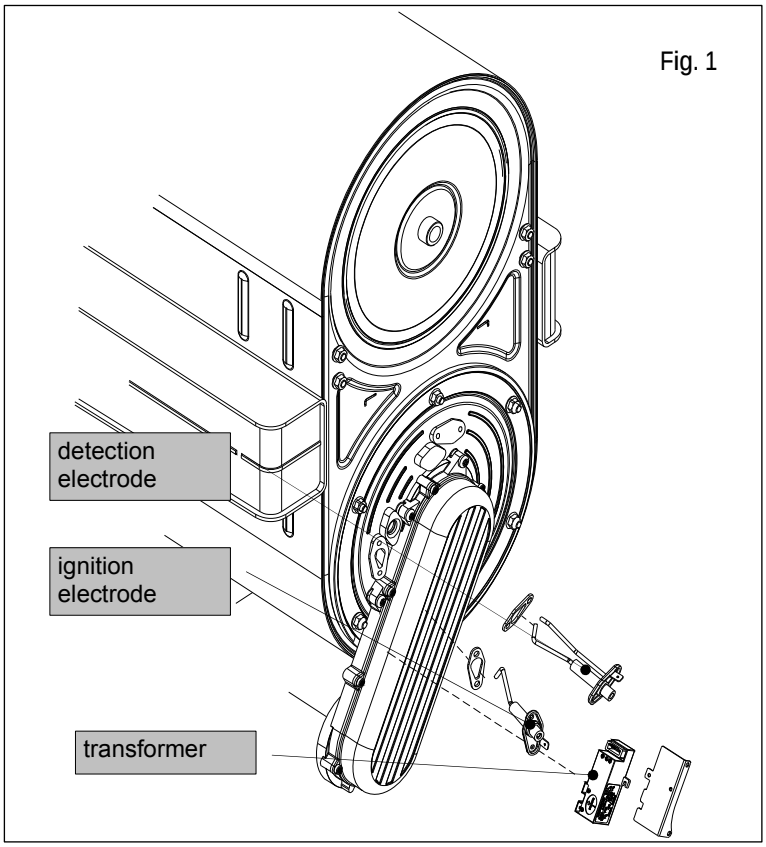


Fig. 1

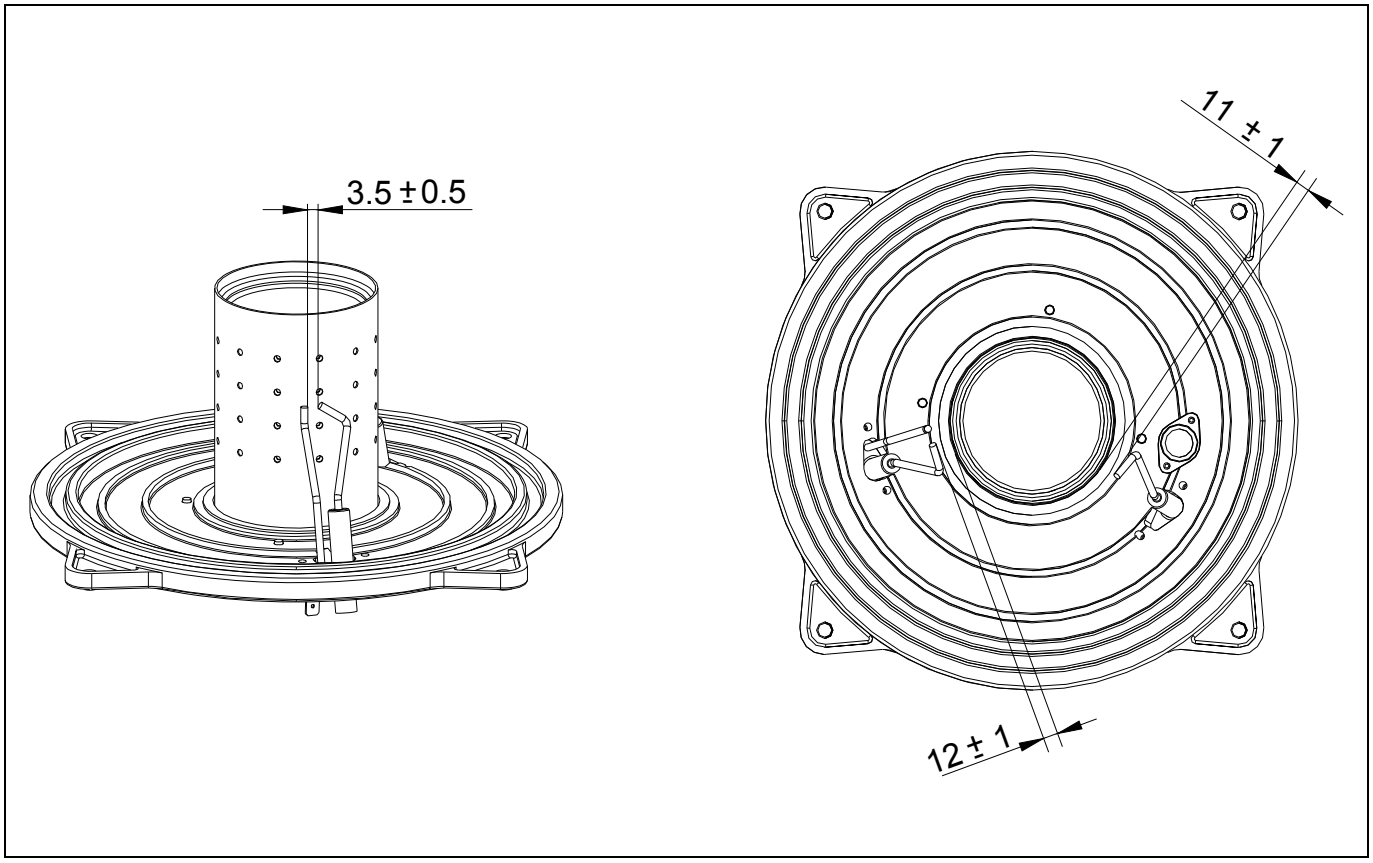
6.6.2 Ignition and/or flame detection electrodes (fig. 1)

- Switch off the power supply;
- Un-Plug the electrode wires;
- Slacken the fixing screws;
- Remove the electrodes. When fitting the new ones, check that the seals are not damaged. Replace if necessary;
- Reconnect the wires and re-assemble the components following the above procedure in reverse order;
- Switch on the power supply and restart the appliance;

⚠ *Check the default positions: make sure that there is a gap of 3±1 mm between detection electrodes, 11±1mm between ignition electrode and burner, 12±1mm between detection electrode and burner, to avoid a boiler malfunction.*



IGNITION / FLAME DETECTOR ELECTRODE POSITION



6.6.3 **Trasformer** (fig. 1)

- Switch off the power supply;
- Un-plug the ignition electrode cable and the plug connecting the cable and the printed circuit board;
- Slacken the fixing screws securing the support plate;
- Replace the transformer;
- Reconnect the wires and re-assemble the components following the above procedure in reverse order;
- Switch on the power supply and restart the appliance;

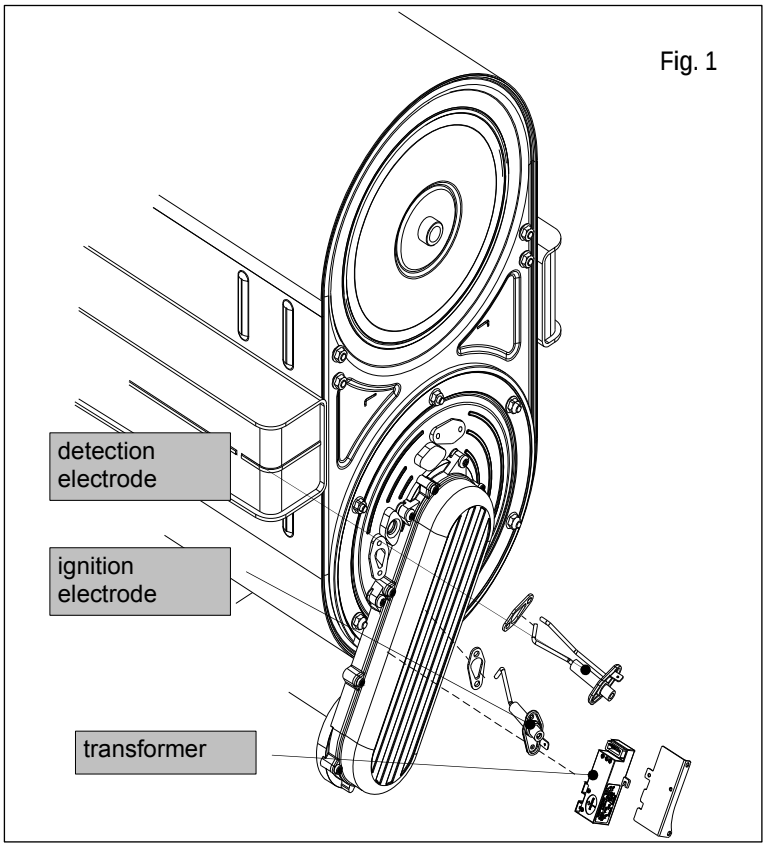


Fig. 1

6.6.4 **Electric fan** (fig. 2)

- Switch off the power and gas supplies to the boiler;
- Remove and dismantle the entire burner unit *(see 6.6.1 "Cleaning the main exchanger module and combustion unit"*);
- Unscrew the four nuts securing the electric fan to the gas manifold and then remove the electric fan;
- Unscrew the fixing screws from the venturi and remove the electric fan, paying particular attention not to damage the cork gasket;
- Replace the electric fan and re-assemble the components following the above procedure in reverse order;
- Switch on the electricity, water and gas supplies and check the soundness of the joint by measuring the CO_2 levels *(see "5.5.1 Max power supply regulation- CO_2 value")*

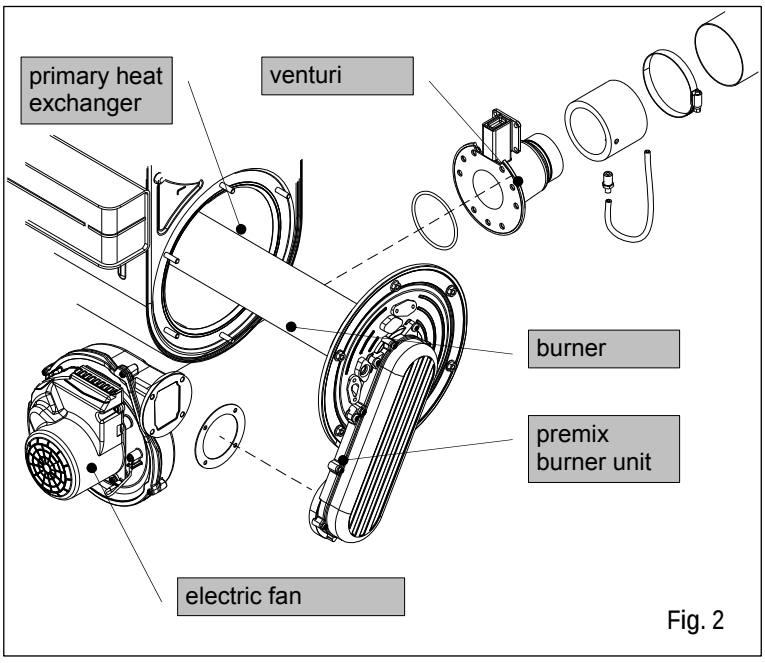


Fig. 2

6.6.5 Safety thermostat (fig. 1)

- Switch off the power supply;
- Un-Plug the connecting wire;
- Unscrew the fixing screws and remove the thermostat;
- Replace the thermostat and re-assemble the components following the above procedure in reverse order;
- Switch on the electricity, water and gas supplies and restart the appliance;

6.6.6 Heating sensor (fig. 1)

- Switch off the power supply;
- Close the drain valves and drain the central heating circuit of the boiler;
- Un-Plug the connecting wire;
- Use a 13 mm spanner to remove the heating sensor;
- Replace the sensor and re-assemble the components following the above procedure in reverse order;
- Switch on the electricity, water and gas supplies, open the shut-off valves and fill the central heating circuit. Then restart the appliance, remembering to discharge any air that may be trapped in the system.

6.6.7 Gas valve (fig. 2)

- Switch off the power and gas supply to the boiler;
- Remove and dismantle the entire burner unit (see *6.6.1 "Cleaning the main exchanger module and combustion unit"*);
- Unscrew and remove the screws securing the gas valve to the venturi;
- Replace the gas valve and re-assemble the components following the above procedure in reverse order:
- Replace all the gas seals;
- Fully tighten the gas connections;
- Switch on the electricity, water and gas supplies and check for any gas leaks using a soapy solution or leak detector spray;
- Proceed with the Off-set regulation *(see "5.5 Regulating the Gas Valve Offset ")*

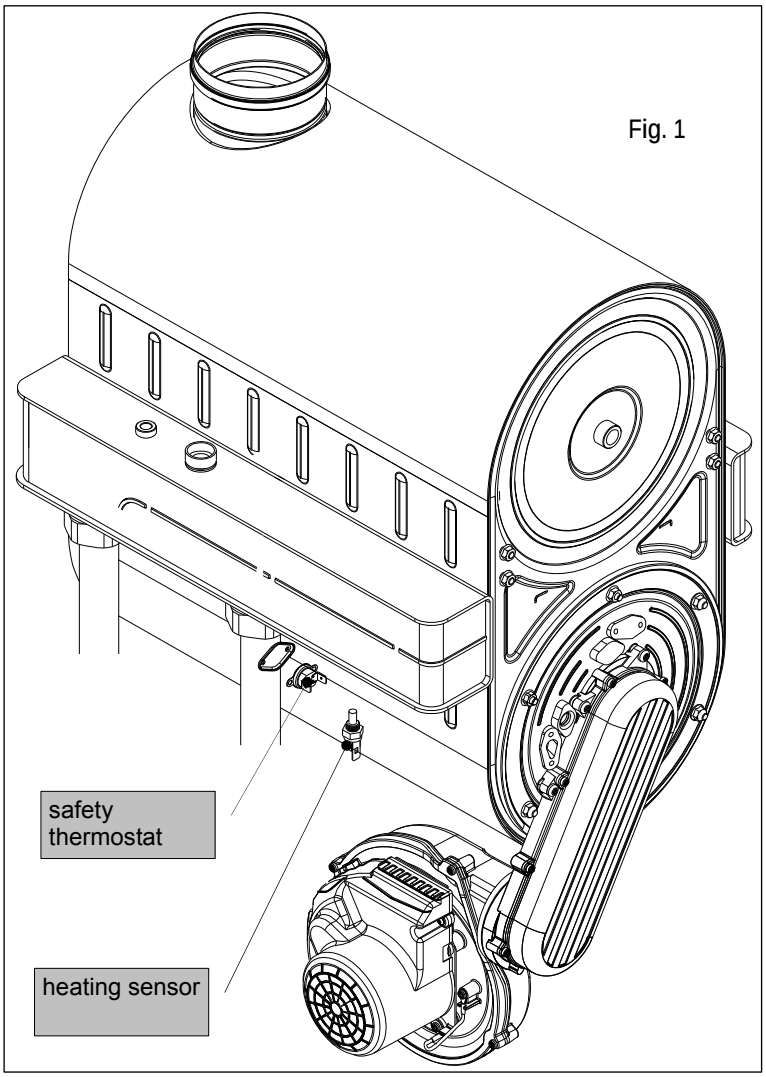


Fig. 1

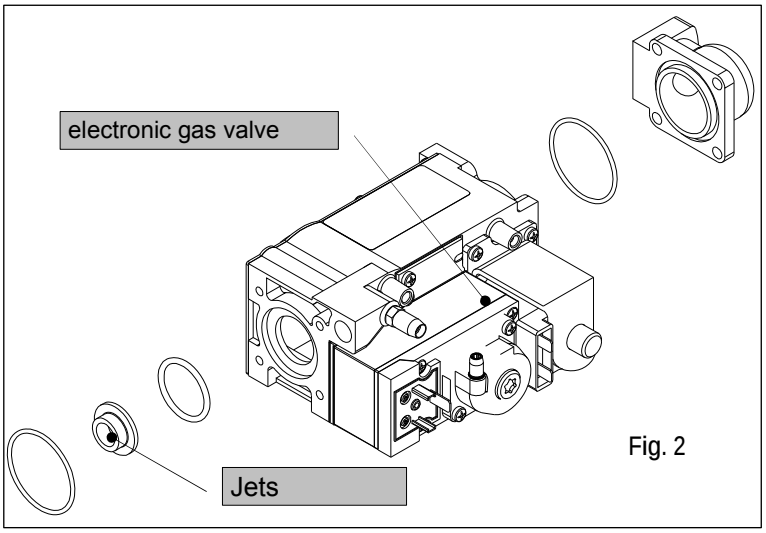


Fig. 2

6.6.8 **Circulating pump** (motor body) (fig. 1)

- Switch off the power and water supply to the boiler;
- Close the shut-off valves and drain the central heating circuit of the boiler;
- Unscrew the four screws securing the motor body to the impeller body;
- Remove the motor body and check the condition of the washer. If necessary, replace the washer.
- Replace the circulation pump and re-assemble the components following the above procedure in reverse order.
- Switch on the electricity, water and gas supplies and fill the system with water. Check for any leaks from the joints and bleed off any air from the circuit. Restart the boiler.

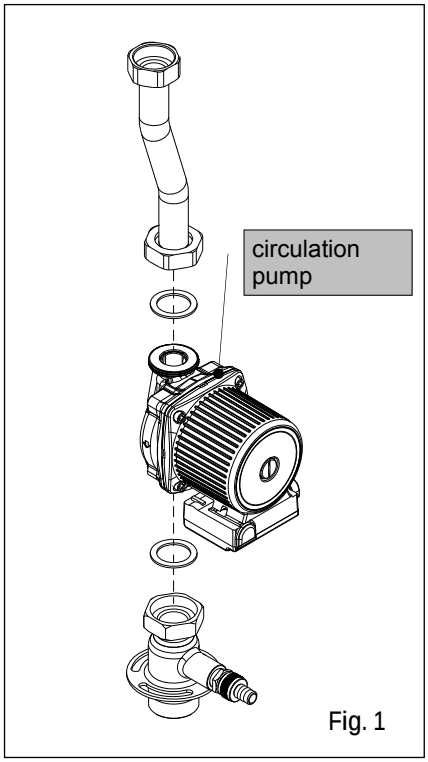


Fig. 1

6.6.9 **Primary heat exchanger** (fig. 2)

Due to the considerable weight of the heat exchanger, pay attention during maintenance operations.

- close the shut-off valves and drain the central heating circuit of the boiler;
- Switch off the power, gas and water supply to the boiler;
- Remove the spring and then the condensate drainpipe;
- Remove the fixing springs and then the delivery and return pipes;
- Remove and dismantle the entire burner unit (see *"6.6.1 Cleaning the main exchanger module and combustion unit"*);
- Remove the support brackets and pull out the heat exchanger;
- Remove the regulation sensor and the support brackets from the old heat exchanger. Refit them to the new one;
- Replace the heat exchanger and re-assemble the components following the above procedure in reverse order;
- Switch on the electricity, water and gas supplies and fill the system with water. Check for any leaks from the joints and bleed off any air from the circuit. Restart the boiler, making sure that there are no gas leaks;

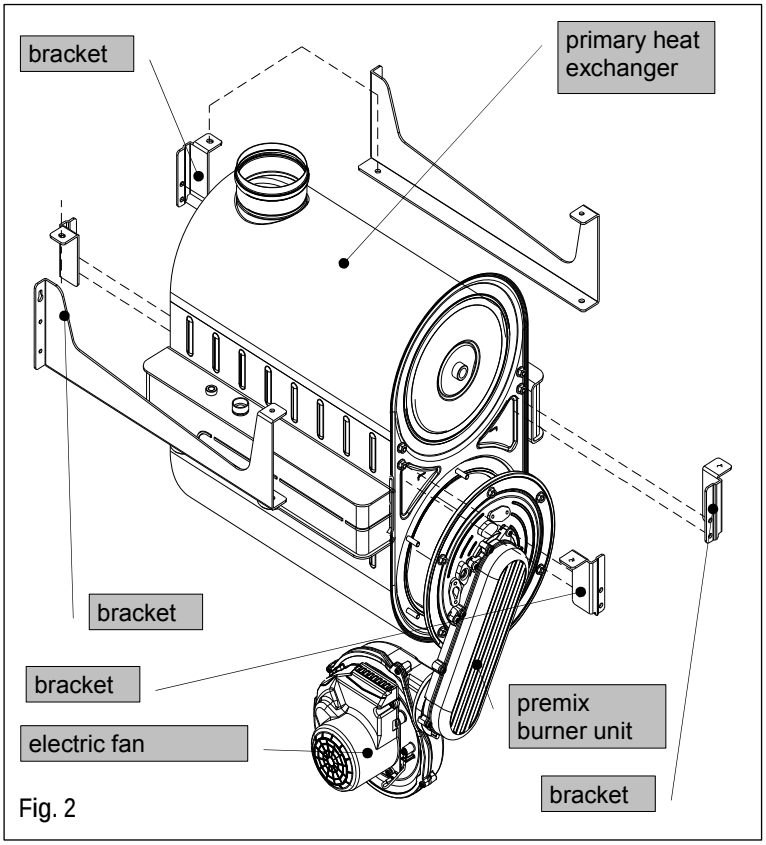


Fig. 2

6.6.10 Modulation circuit board (see fig. 1-2)

- Open the control panel *(see 6.3 "Accessing the boiler");*
- Disconnect all the connectors, remove the regulating knobs, unscrew the four fixing screws and remove the modulation circuit board;
- Replace the circuit board and re-assemble the components following the above procedure in reverse order;
- Switch on the electricity, water and gas supplies and regulate the boiler *(see 5.4 "Gas data")*;

The present parameters of the printed circuit board correspond to a 100 kw only heating condensing boiler fed by natural gas.

When replacing the modulation circuit board, it's necessary to set parameter according to the boiler model (see 5.3" Setting the parameters*').*

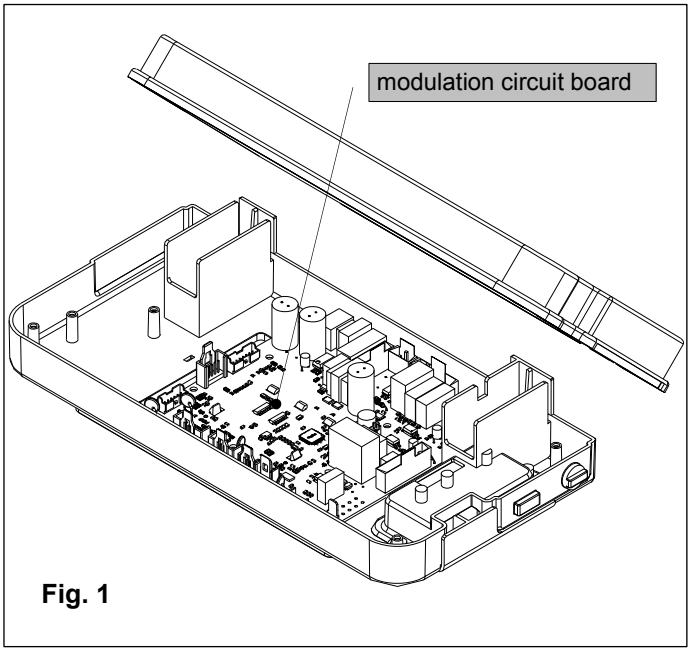


Fig. 1

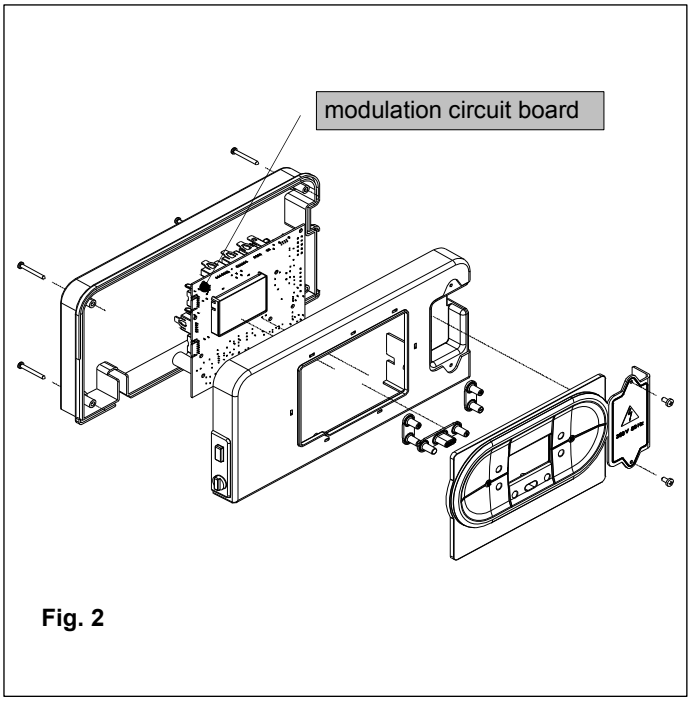
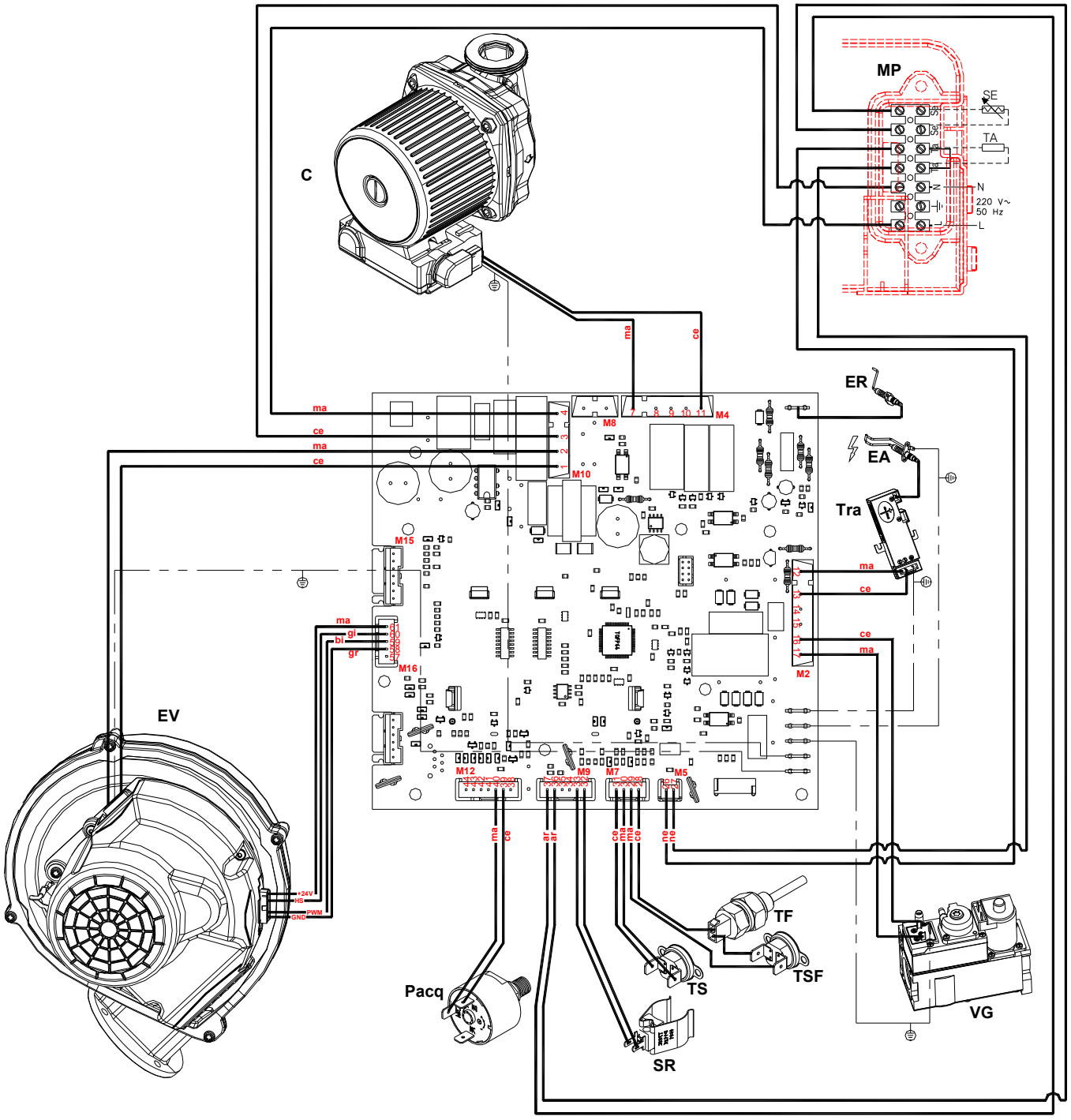


Fig. 2

6.8 Wiring diagrams

6.7.1 Only heating version - R



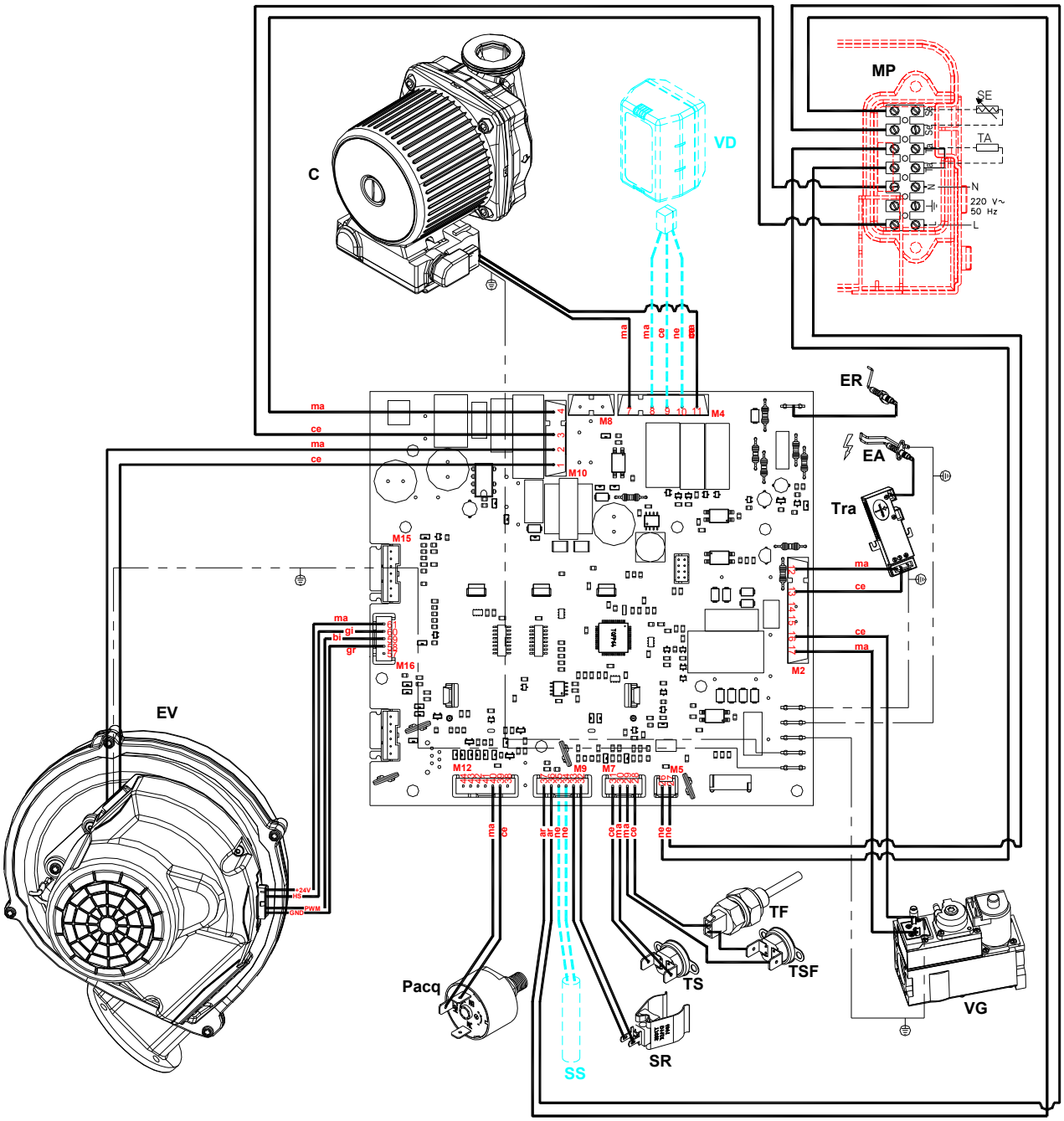
Key	
ER:	Ionisation electrode
EA:	Ignition electrode
C:	Circulating pump
VG:	Gas valve
TRA:	Ignition transformer
TF:	Thermo fuse (102 °C)
TS:	Safety thermostat

Pacq:	Water pressure switch
SR:	Heating sensor
EV:	Fan
MP:	Terminal board
SE:	Outdoor temperature sensor
TA:	Open Therm Remote control - Room thermostat
TFS:	Safety thermo fuse 318°C

L:	Line
N:	Neutral
ne:	Black
ce:	Blue
ma:	Brown
ar:	Orange
gi:	Yellow
bi:	White
gr:	Grey

6.7.2 Only heating + storage cylinder installation version - RS

See olso "3.8.5 3-way valve kit fitted for D.H.W. storage cylinder connection"



Remote storage cylinder connection

- *M9 terminal block DHW cylinder sensor*: insert the sensor cable inside the control panel inserting terminals 34 and 35. It is not necessary to follow a sequence with the wires.
- *M4 terminal block – 3-way valve*: connect the 3-way valve motor cable through the Molex terminal. Insert the cable inside the control panel and connect cable terminals to M4 terminal block respecting the following coupling: light-blue – terminal no.9; brown – terminal no.8; black – terminal no.10

Key	
ER:	Ionisation electrode
EA:	Ignition electrode
C:	Circulating pump
VD:	**Diverter valve**
VG:	Gas valve
TRA:	Ignition transformer
TF:	Thermo fuse (102 °C)
TS:	Safety thermostat

Pacq:	Water pressure switch
SR:	Heating sensor
SS:	**D.H.W. sensor** (remote storage cylinder)
EV:	Fan
MP:	Terminal board
SE:	Outdoor temperature sensor
TA:	Open Therm Remote control - Room thermostat
TFS:	Safety thermo fuse 318°C

L:	Line
N:	Neutral
ne:	Black
ce:	Blue
ma:	Brown
ar:	Orange
gi:	Yellow
bi:	White
gr:	Grey

6.8 Troubleshooting

To display the last 5 errors, keep pressed the ' ⓘ ' INFO button, in OFF mode position, for 5 seconds. The errors number will appear in chronological order (-1- = first fault… -5- = last fault). Use ' ⊕ ' and ' ⊖ ' buttons of Heating Temperature setting, to scroll the list of saved errors. To reset the errors list press the' Ⓡ ' RESET button. Press the ' ⓘ ' INFO button to exit the errors display mode.

ERROR CODE	PROBLEM	POSSIBLE CAUSE	REMEDY	RESET
E01	IONISATION PROBLEM	*WITHOUT FLAME IGNITION* a. NO GAS. b. IGNITION ELECTRODE BROKEN OR EARTHED. c. GAS VALVE MALFUNCTION. d. IGNITION SEQUENCE SET TOO LOW. *WITH FLAME IGNITION* e. POWER SUPPLY LINE AND NEUTRAL CABLES REVERSED. f. IONISATION ELECTRODE MALFUNCTION. g. IONISATION ELECTRODE CABLE DISCONNECTED.	a. CHECK MAINS GAS SUPPLY. b. REPLACE PART. c. REPLACE PART. d. SET THE IGNITION SEQUENCE. e. CONNECT THE BOILER PROPERLY. f. REPLACE PART. g. CONNECT THE IONISATION ELECTRODE CABLE.	Manual Reset (press the ' Ⓡ ' Reset button)
E02	SAFETY THERMOSTAT TRIPPED (95°C)	h. THERMOSTAT MALFUNCTION OR OUT OF CALIBRATION. i. THERMOSTAT CABLE DISCONNECTED.	i. REPLACE PART. j. CHECK THE WIRING.	Manual Reset (press the ' Ⓡ ' Reset button)
E03	102° C THERMO FUSE TRIPPED	k. THERMO FUSE BROKEN. l. THERMO FUSE CABLE OR POWER SUPPLY DISCONNECTED.	k. REPLACE PART; l. CHECK THE WIRING AND THE POWER SUPPLY CONNECTION.	Manual Reset (press the ' Ⓡ ' Reset button)
E04	NO WATER IN THE SYSTEM	m. INSUFFICIENT WATER PRESSURE IN THE SYSTEM (STOPS AT 0.3 BAR). n. WATER PRESSURE SWITCH CABLE DISCONNECTED. o. WATER PRESSURE SWITCH MALFUNCTION.	m. FILL THE SYSTEM. n. CHECK THE WIRING. o. REPLACE PART.	Automatic
E05	HEATING SENSOR	p. SENSOR MALFUNCTION OR OUT OF CALIBRATION (RESISTANCE VALUE 10 kOhms AT 25 °C). q. SENSOR CABLE DISCONNECTED OR WET.	p. REPLACE PART. q. CHECK THE POWER SUPPLY CONNECTION.	Automatic

ERROR CODE	PROBLEM	POSSIBLE CAUSE	REMEDY	RESET
E06	D.H.W SENSOR / CYLINDER *(RS version only - with connection to a remote storage cylinder)*	r. SENSOR MALFUNCTION OR OUT OF CALIBRATION (RESISTANCE VALUE 10 kOhms AT 25 °C). s. SENSOR CABLE DISCONNECTED OR WET.	r. REPLACE PART. s. CHECK THE POWER SUPPLY CONNECTION.	Automatic
E15	RETURN SENSOR	t. SENSOR MALFUNCTION OR OUT OF CALIBRATION (RESISTANCE VALUE 10 kOhms AT 25 °C). u. SENSOR CABLE DISCONNECTED OR WET.	t. REPLACE PART. u. CHECK THE POWER SUPPLY CONNECTION.	Automatic
E16	FAN	v. BURNT w. POWER SUPPLY CABLE MALFUNCTION	v. REPLACE PART. w. REPLACE PART.	Automatic
E18	INADEQUATE CIRCULATION	x. PRIMARY OR SECONDARY HEAT EXCHANGER OBSTRUCTED. y. PUMP MALFUNCTION OR PUMP IMPELLER DIRTY.	x. CLEAN OR REPLACE PART. y. CLEAN OR REPLACE PART.	Automatic
E21	GENERAL PCB MALFUNCTION	z. MICROPROCESSOR MALFUNCTION: IT DETECTS A WRONG SIGNAL .	z. THE PCB RESETS AUTOMATICALLY THE ERROR.	Automatic
E22	PARAMETER PROGRAMMING REQUEST	aa. LOSS OF MICROPROCESSOR MEMORY.	aa. REPROGRAM PARAMETERS.	Manual Reset (Switch off the power supply)
E35	FLAME DETECTION MALFUNCTION	bb. IONISATION ELECTRODE MALFUNCTION cc. IONISATION ELECTRODE CABLE MALFUNCTION dd. PRINTED CIRCUIT BOARD MALFUNCTION	bb. REPLACE OR CLEAN PART cc. REPLACE PART dd. REPLACE PART	Manual Reset (press the ‘ ® ’ Reset button)
E40	ELECTRIC POWER SUPPLY	ee. ELECTRIC POWER SUPPLY OUT OF THE OPERATION RANGE	ee. CHECK THE POWER SUPPLY NETWORK (THE ERROR DISAPPEARS AUTOMATICALLY WHEN THE POWER SUPPLY IS BACK WITHIN THE REQUIRED RANGE)	Automatic

6.9 Function codes

6.9.1 Function codes

Code	Function	Description
F07	Flue test function active (Chimney-Sweeper)	Pressing ' ® ' button for 7 seconds the Flue test function is enabled. Pressing the boiler Off button the function is disabled. The Flue test function operates the boiler at the maximum heating pressure for 15 minutes without any modulation. The function is useful for combustion testing.
F08	Frost Protection function (Central heating circuit)	The function is automatically enabled when the heating sensor detects a temperature of 5 °C. The boiler operates at minimum gas pressure with the diverter valve in the 'winter' position. The function is disabled when the temperature detected by the sensor reaches 30°C.
F09	Frost Protection function (D.H.W circuit) *(RS version only - with connection to a remote storage cylinder)*	The function is automatically enabled when the D.H.W sensor detects a temperature of 4 °C. The boiler operates at minimum gas pressure with the diverter valve in the 'summer' position. The function is disabled when the temperature detected by the sensor is 8 °C in the D.H.W circuit or 30 °C in the central heating circuit.
F28	Legionella Prevention Function	Function active for storage boilers only. It comes into operation every 7 days. It brings the hot water temperature of the storage cylinder up to 60°C whatever temperature value is set for hot water.
F33	System purging function	The function is automatically enabled at the first ignition of the boiler. The boiler operates a series of cycles for a period of 5 minutes. Each cycle consists in: the pump is enabled for 40 seconds and then disabled for 20 seconds. The starting of the boiler is only allowed at the end of this function. In case of an open contact of the water pressure switch, this function can be enabled during the normal boiler operation. Once the contact is closed a purging cycle of 2 minutes is performed.

6.10 Parts list

6.10.1 Main components

code	description
25-00055	PUMP UPS 25-80 130
25-00064	WASHER EDPM 1" 1/4
25-00065	CONDENSATE TRAP
25-00066	CONDENSATE DRAIN PIPE
30-00003	CONDENSING EXCHANGER DUO 100 KW
30-00008	GAS VALVE w/CABLE
30-00009	VENTURI MANIFOLD
35031LA	IGNITION ELECTRODE ISO
35032LA	FLAME IONISATION ELECTRODE ISO
37035LA	EXHAUST FAN NRG137
40-00020	DIAPHRAGM Ø 11
40-00077	PRINTED CIRCUIT BOARD DIGITECH CS MIAH400
43001LA	WASHER Ø 23.5x17x2 3/4"
43055LA	1/2" O-RING WASHER
43235LA	WASHER 1" 1/2 5x35x2 AFM34 o 44x35x2 AFM34
47024LA	ON/OFF SWITCH L5 16A/250V
50-00013	VENTURI - AIR INTAKE PIPE CONNECTION
55-00016	O-RING 4275 EXHAUST FAN/VENTURI MANIFOLD
59015LA	WATER PRESSURE SWITCH
73507LA	D.H.W. - HEATING 1/8" WHITE SENSOR
73517LP	THERMO FUSE 102°C RED ISOTHERM.
86006LA	SAFETY THERMOSTAT 95C°
88023LA	TRANSFORMER AC1 230V AC 60 HZ
96005LA	3 BAR RELIEF VALVE ½”
96012LA	AUTOMATIC AIR VENT VALVE 3/8”

Heating technology since 1959

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